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FACTS
ESTABLISHING THE EFFICACY
OF THE
OPIATE FRICTION
IN
SPASMODIC AND FEBRILE DISEASES.

ALSO,

Outlines

*Of an Attempt to investigate the Nature, Causes, and Method
of Cure, of*

HYDROPHOBIA & TETANUS.

Republished from the London Medical and Physical, and the
Edinburgh Medical and Surgical
Journals.

TO WHICH ARE ADDED

CASES AND REMARKS

NOT BEFORE PUBLISHED.

BY MICHAEL WARD,

Late Surgeon to the Manchester Infirmary, Dispensary, &c. &c.

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TO

John Bill Esq.

SURGEON,

THE FOLLOWING

SHEETS,

ARE WITH GREAT REGARD AND ESTEEM

INSCRIBED,

BY HIS

OBLIGED AND AFFECTIONATE FRIEND

THE AUTHOR.

John B. B. B.

RECEIVED

1877

INTRODUCTION.



THE first communication contained in the following pages was published in the first volume of the London Medical and Physical Journal in 1799; and the succeeding ones have appeared in the same work, (excepting three in No. XVI, which are taken from the Edinburgh Medical and Surgical Journal,) at different periods since that time.

Various motives have induced me to republish them.

1. At the time I began to apply opium *externally, with a view to its absorption, as a substitute for the internal use of that medicine*, the practice was new in this country; and so favourable were the effects resulting from it in the first instance in which I had occasion to employ it, as to induce the late Dr. Percival, and many other professional gentlemen of acknowledged ability, to have recourse to the same method of treatment in spasmodic and febrile diseases, and in gangrene, with a degree of success which seems to have exceeded their most sanguine expectations; and it is worthy of remark that in most of the cases, I believe I may say in all,

the usual resources of medical practice had been previously employed, but without effect. And the narratives being given on the authority of gentlemen of undoubted repute, renders it certain, that every thing had been done consistently with the most approved methods of treatment, before recourse was had to the remedy in question: they are therefore entitled to all the consideration and influence, which it is possible for the most legitimate evidence to confer.

The idea was originally suggested to me by an extract of a letter, (a copy of which is given in page 1,) which I had met with in Duncan's *Annals of Medicine* for 1798, from Dr. Chiarugi of Florence to Dr. L. Frank, on the effects of opium applied externally in maniacal delirium.

It occurred to me, that as it had produced calmness and sleep in that disease, it might probably have similar effects in a delirium arising from fever: and I had soon an opportunity of putting it to the test in the case of a young man in the last stage of the typhus, who was to all appearance, in a hopeless state; but who began to amend as soon after the anodyneunction had been made use of, as the opium could be supposed to be absorbed and carried into the circulation, in a frame so debilitated.

His recovery was speedy and complete, and he soon afterwards went abroad in a naval department, and enjoyed as good health as at any

former period, until October 1805, when he was unfortunately killed at the battle of Trafalgar on board Lord Nelson's Fleet.

2. The efficacy of the plan being fully established by the result of the following Cases, from which it appears, that many valuable lives have been apparently snatched from the grave by this powerful and valuable remedy, I consider it a duty which I owe to the community, to collect the scattered facts relating to this curious and interesting subject, and to give them that publicity which their importance, and the good they are calculated to produce, demand.— It is also fit it should appear in what manner the scheme originated, and how far I have been instrumental in introducing it into general notice, and in extending the sphere of its usefulness, by suggesting the probability of its proving applicable, under certain circumstances, to a much wider range of diseases than had been pointed out before: an opinion which has been in a great measure confirmed by subsequent experience.

3. The event having proved favourable far beyond my expectations, has suggested to my mind a train of ideas, which I would willingly hope may lead to results, not entirely void of *practical* utility. But whether this may prove to be the case to the extent that I imagine, or not; as the method I have pursued originated in this source, it seems more convenient to bring

the whole of the evidence together, than to quote it irregularly as would otherwise be necessary.

This being done, my next object will be, if health permit, and the following be favourably received, to publish some additional remarks on the Cases, and speculations on the *modus operandi* of the medicine, with an enlarged copy of the Outlines on Hydrophobia and Tetanus, with Notes and Illustrations on a more extended plan, than those contained in the present collection. In the mean time, the papers which I have published on these and other subjects, and which are *not* included in this Essay, may be seen by referring to the Medical and Physical Journal; Vol. 2. p. 134. Vol. 4. p. 37. Vol. 7. p. 124; 341, and 497. Vol. 8. p. 325; and 388. Vol. 9. p. 40; 335, and 545. Vol. 10. p. 448. Vol. 11. p. 111, Vol. 17. p. 353, and 457.

The Articles contained in the following sheets are numbered for the sake of convenience in adding the notes, &c., reserved for the second part. For the same reason I have divided No. XIV into twenty-three sections instead of fifteen. It is also proper to remark, that the notes inclosed in brackets, are now added.

Manchester, Aug. 28, 1809.

TABLE of CONTENTS.



	<i>Pages.</i>
Introduction	vii .. x
A Letter on the external use of opium from Dr.	
Chiarugi to Dr. L. Frank	1 .. 3
ARTICLE I. Facts &c. relative to the external application of opium by friction ; including, a case of typhus, and two cases of maniacal delirium, successfully treated by the opiate friction : case of nervous head ach, and one of chronic rheumatism, in which it did not succeed : the same mode of treatment recommended in painful menstruation, and in mortification of the toes and feet : inferences drawn from the facts : the opiate friction recommended in hydrophobia and tetanus : manner of applying it : the propriety of administering medicines &c. <i>internally</i> in hydrophobia and tetanus, questioned	4 .. 21
ART. II. A case of delirium occurring in a fracture of the leg, cured by opiate friction : a case of chronic dysury, and one of calculus, relieved : queries proposed and answered : the tincture of opium in general preferable to the powder for external use : its efficacy in hysteria.....	22 .. 28
Memoir of the late Dr. Percival	29 .. 32
ART. III. A case of typhus cured by the opiate friction :.....	33 .. 36
ART. IV: and V. Two cases of gangrene successfully treated.....	36 .. 42
ART. VI. A case of symptomatic hiccough, attended with a similar result.....	42.. 46

ART. VII. A case of vomiting and diarrhœa, accompanied by hiccough &c. which terminated favourably	46 .. 48
ART. VIII. Powdered opium recommended in particular instances for external use, in preference to the tincture: a case of vomiting and diarrhœa relieved; and a case of tetanus cured, by the frictio opiata.....	48 .. 54
ART. IX. Recapitulation; practical remarks ..	55 .. 77
ART. X. Mr. Döcker's second letter, containing the sequel of the case of John Bayley; and additional evidence of the efficacy of the opiate friction in gangrene.....	78 .. 80
ART. XI. Its efficacy in cholera morbus, and in hooping cough, with cases of the latter successfully treated.....	80 .. 85
ART. XII. Mr. White's second letter, containing a case of maniacal delirium, successfully treated ..	86 .. 88
ART. XIII. A case of trismus traumaticus which terminated in recovery	88 .. 91
Preliminary remarks to the Outlines of hydrophobia and tetanus	92 ..101
ART. XIV. Outlines of hydrophobia and tetanus: the opiate friction employed in a case of hydrophobia; and in five cases of tetanus: its effects: <i>the cold affusion recommended in hydrophobia and tetanus</i> ; mode of applying it; the causes of the uniform failure of internal remedies, and the consequent fatality of hydrophobia, explained; the patient not to be urged to drink, or take medicines, whilst a difficulty in swallowing continues; the articles supposed proper on the removal of that obstacle. Prevention of hydrophobia; excision; pure kali; shower bath; exercise, diet, aperients	102..124
ART. XV. Cursory remarks on diabetes; tepid and cold affusion suggested; precautions to be observed in their application	125..132

ART. XVI. Cases of tetanus, cured by the cold affusion; the opiate friction, &c. designed to establish a determinate mode of treatment in that disease; explanatory remarks 133..168.

ART. XVII. Supplement to Art. XIV, containing additional remarks on the nature and method of cure of hydrophobia and tetanus; the hydrophobic and tetanic aura conveyed by the nerves from the injured part, to the muscles affected with spasm; how manifested; success in the treatment of hydrophobia not probable, unless the aura can be intercepted in its passage from the injured part to the sensorium; the nerves principally concerned in producing hydrophobia; indications of cure; plan of treatment advised; pressure applied to the nerves *above* the part affected; kali purum; division of one or more nerves in the upper and lower extremities proposed; in what cases and circumstances advisable; opiate friction, and plasters; antispasmodics internally in certain circumstances; *the cold affusion*; purgatives. Different branches of nerves have been divided with success in Tic Douloureux; a similar result anticipated in hydrophobia; objections to the operation proposed, answered; precautions to be observed; *a case of tetanus in which the pain was diminished, and the patient's sufferings were in some degree relieved by applying pressure, as recommended in this article.* Tetanus adverted to in horses; *causes and progress* of the disease in this animal; its treatment, and general fatality; two instances of recovery mentioned. The cold affusion employed in a case of hydrophobia at Glasgow, *two or three years ago*; and *in a second case lately admitted at the Manchester Infirmary.* Remarks on the composition and mode of applying the frictio opiata 168..184

ART. XVIII. Three cases of hysteria cured, and one of palpitation of the heart in an hysterical tem-

perament relieved, by the frictio opiata: the external application of opium recommended in the spasmodic croup; and in other spasmodic affections of the larynx and bronchiæ; the bowels do not become constipated from the use of the O. F..... 184..192

ART. XIX. Three cases of maniacal delirium cured by opium applied externally; reasons for adopting a similar mode of treatment in phrenitis; in the different species of melancholia; in puerperal convulsions; in catalepsis and in risus sardonicus; and in jaundice when attended with spasmodic affections of the biliary ducts; with the addition of the cold affusion, and aperients, in the three last mentioned disorders 192..204

ART. XX. The utility of the opiate friction in the convulsions occurring during the eruptive fever of the small pox, evinced in two instances; cursory remarks on the fatality of this disease, and on the comparative safety and advantages of the cow pock: a case of spasmodic cough cured by the opiate friction..... 204..208.

ERRATA. — P. 12, line 6, *for* generally *read* generally; p. 84, l. 12, *for* conntenance *r.* countenance; p. 35, l. 27, *for* eommencement *r.* commencement; p. 48, l. 3, *for* diarrœa *r.* diarrhœa; p. 88, l. 22, *for* TRAUMATICA *r.* TRAUMATICUS; p. 113, l. 16, *for* specators *r.* spectators; p. 159, l. 26, *for* contenance *r.* countenance; p. 171, l. 22, *for* pura *r.* puro; p. 178, l. 29, *for* unsuccesfully *r.* unsuccessfully; p. 201, l. 25, *delete* at.

FROM

Duncan's Annals of Medicine

FOR 1798.

A LETTER on the external use of Opium to Dr. L. Frank, from Vincenzo Chiarugi, M. D. and Physician to the Hospital of St. Boniface at Florence, 8vo. 1797.

“ In this letter the observations contained in the preceding article *, are partly contradicted, and partly confirmed. The author, who is well known, from his very elaborate work on mental derangement, is chief Physician to the great Hospital of St. Boniface, which is appropriated entirely to maniacs. In treating their

* “ A Discourse on the mode of acting on the human body, by means of frictions made with saliva and other animal fluids, and the various substances commonly given internally. Recited in the University of Pavia. By Cit. V. L. Brera, M. D. Professor of Medicine, Clinical Lecturer and Surgeon to the National Legion of Pavia.” 3d. Edit: 1796.

diseases Dr. Chiarenti's discovery promised to be of great importance; and our author immediately resolved to carry it into practice. He was not, however, ignorant of the effects already observed by many practitioners from the external exhibition of this drug, and was persuaded that its action on the nervous system might be obtained, though not introduced into the stomach, without being dissolved in the gastric fluid, from the mere emanation of its volatile aroma. He therefore resolved to try it in the form of a simple ointment, made by incorporating a dram of finely powdered opium, with a pound of axunge. An ounce of this ointment, containing six grains of opium, procured sleep to a restless boy, who had been an idiot from his birth. Its effects were still more surprising on a peasant, in the height of a paroxysm of the most furious mania. *These frictions always rendered him calm, and sometimes threw him into a state of lethargic stupor. In this case a complete cure was at last effected.* It was exhibited in the same manner to twelve other persons, affected with mental or re-active madness; and from his observations on them he concludes, that although the sleep produced was not always proportionate, either in intensity or duration, to the dose of the opium; *yet a state of calmness constantly succeeded, sooner or later; and five of them have been cured, without the use of any other remedy.* Certain of the efficacy of the opiate ointment, he

tried frictions of laudanum, diluted with a little alcohol; and found them equally successful.

“ These experiments being all made on patients who were tied, there could not be any suspicion that the opium was swallowed. Dr. Chiarugi thinks, that they fully establish the fact, that opium, however applied to the skin, penetrates it, and exerts its action diffusively on the nervous system, without any necessity for its being mixed with gastric juice, provided it be sufficiently divided or diluted. Although, therefore, our author does not agree with Dr. Chiarenti in all his opinions, he confesses the utmost obligations to him, for having led him to a practice, from which he has derived much benefit in a disease in which it is so difficult to exhibit medicines internally. ”

No. I.

From the London Medical and Physical Journal,
Vol. 1. p. 441.

.....

*Facts and Observations relative to the external
 Application of Opium by Friction, so as to be
 absorbed by the Lymphatics.*

IT appears to be not only a professional but a moral duty, to lay before the public, at an early period, improvements in the healing art, which are sufficiently well authenticated, and may be adopted by others, without impropriety or danger, in similar cases. On this ground, I trust, the communication of the following facts and observations will be justified. To adopt the words of an eminent writer on a *different* occasion, “ If this was an experiment, in which the life, or limb, or health of the patient was in any degree endangered, or by which the person on whom it may be tried, could in any degree be injured, I should have withheld what I now publish until a greater length of time and more experience had rendered it still more absolutely certain; and I should have thought myself vindicable in so doing; but, as

this is a medicine whose general effects are well known, and which is at the same time so capable of direction and management, that it is almost impossible for any person who deserves to be trusted with medicine at all, to do any material harm with it, I thought it would be wrong and unjust to conceal what had occurred to me, lest I might thereby deprive the afflicted of an assistance which, I verily believe, is not to be obtained from any other quarter."

May 14, 1799. Mr. G. P., fourteen years of age, became delirious on or about the eleventh day from the commencement of typhus. Musk, opium, &c. were prescribed, both by myself, and afterwards by Dr. Percival, without his becoming composed or rational; except at intervals. On the contrary, the delirium increased till the seventeenth or eighteenth day, when he became extremely restless and turbulent, requiring two persons to keep him in bed. He continued in this state till the evening of the twentieth or twenty-first day, when he seemed nearly exhausted. His feet were cold, his pulse weak and irregular, and he discharged his urine and stools involuntarily.

He had taken $5\frac{1}{2}$ grains of opium, 54 of musk, and the same of volatile salt in the last 48 hours: but could not now retain them on his stomach.

Not having an opportunity of consulting with Dr. Percival at that time, and not supposing it possible for our patient to live more than an hour or two, unless a speedy change could be effected; I directed six grains of opium, finely powdered, to be mixed with an ounce of lard, and to be divided into two equal parts: one of them to be rubbed on the inside of one leg, and the top of the foot, directly: and the other on the other leg and foot, in two or three hours afterwards.

May 15. At ten A. M. I was surprised to find the patient better, and in a quiet, comfortable sleep: and was informed the attendants expected every gasp would have been his last, till four o'clock, (six hours after the first portion of ointment was rubbed in) when he became a little calmer, and grew gradually more so till eight; he then began to dose, and at nine fell into an easy sleep. Dr. P. and I visited him at twelve, and were pleased and surprised to find him still asleep.

At ten P. M. he was perfectly composed, and had slept from the time I last saw him till half past four, when he awoke, *said he was hungry, and asked for some bread and butter, and tea*: he then expressed a wish to have his bed made, sat up ten minutes, and eat an orange: and when removed to bed, fell asleep directly, and slept till eight; when he seemed uneasy, and had a slight return of the delirium. Six grains

of opium were now rubbed in on one thigh, agreeably to the directions we had given. When the friction had been continued half an hour, he desired the nurse to desist, and fell asleep immediately. His pulse, which had hitherto varied from 100 to 120, was now only 80, but stronger.

May 16. At five A. M. Mr. P. came to tell me, his son had slept well till two; but was now restless and uneasy, and that he had used the last portion of the ointment; expressing himself in terms which could not fail of being highly agreeable to a mind not destitute of sensibility.

Eight grains of opium, mixed with three drachms of lard, were directed to be rubbed in immediately.

Ten A. M. I was informed, he could not bear the friction longer than eight or ten minutes. He was now restless; but not delirious; pulse scarcely perceptible. Wine was prescribed. At twelve, Dr. P. found him in the same state, and prescribed tinct. opii. gt. xv. 4ta quaq. horâ. At ten, P. M. he was easy and rational; but had not slept much; pulse 92; *tongue much cleaner*; skin cool. Nine grains of opium, mixed with three drachms of lard, were now ordered to be applied, and the same quantity to be repeated in four hours, unless he became composed.

May 17, twelve o'clock. The first portion of ointment only was applied; and he soon

grew tired of the friction, so that very little could have been absorbed. I was aware of this being likely to happen, and therefore had ordered an increased quantity of opium. He was now calm and rational; but had not slept well. Pulse 100. Omit. ung.—Contin. tinct. opii. At eight, P. M. pulse 96; quite easy. Contin. tinct. opii.

May 18. Slept well last night; appetite improved; tongue clean; pulse 96, regular, and somewhat stronger.

May 20. Sleeps well and improves rapidly.

The quantity of opium applied externally was 35 grains, and this was rubbed on the legs and thighs, in the course of the lymphatics, at six different times, in forty-eight hours; not in equal proportions, or at regular intervals; but whenever he began to grow uneasy.

The opium was powdered exceedingly fine.

This history I communicated to Dr. Percival; from whom I have since received the following cases and remarks; which I shall deliver in his own words.

“The narrative you read to me this morning, I believe to be perfectly accurate; and I now send, agreeably to your request, a brief statement of the two cases I mentioned to you, in which opium was externally applied with much apparent benefit.

“You have a just claim to this communication; because it was from my being in some degree persuaded of the success of the practice

you pursued in the instance of our patient, Mr. P. jun. that I was induced to adopt the same mode of treatment.

“ May 16, 1799. I was called to visit Mrs. —, a lady about forty-six years of age, subject to epileptic fits, to anomalous gout, and to temporary mental derangement. I found her in a state of high delirium, without fever. Having remarked that, under similar circumstances, the internal exhibition of laudanum aggravated the affection of her head, probably by producing inebriation, I regarded this as a peculiarly favorable opportunity of trying the use of opium externally. I therefore directed three drachms of laudanum to be mixed with an equal quantity of olive oil, by the yolk of an egg, and to be diligently rubbed into the legs. The friction was soothing and grateful to her; and in a few hours, she was observed to become considerably calmer. The like inunction was repeated at night.

“ May 17. I found her perfectly composed and rational. She had enjoyed much refreshing sleep. Her pulse was regular, her heat natural, and a gentle perspiration had taken place soon after the first inunction.

“ The same plan was continued.

“ May 18. She remained perfectly composed and rational. During the space of forty-eight hours, the inunction had been four times renewed. It was performed with due diligence

and care ; and the hand of the servant who rubbed in the liniment was covered with a smooth bladder.

“ What proportion of the twelve drachms of laudanum, thus consumed, may be supposed to have been conveyed by absorption into the system ? *

“ May 17, 1799. Mr. ———, a gentleman between thirty and forty years of age, of a delicate make, had been confined by a low fever more than a week. Last night a delirium occurred, which progressively increased in violence ; so that this morning I found him in a state of maniacal fury, yet with a languid pulse.

“ A bolus of musk, volatile salt and opium, was prescribed. But the patient loudly and peremptorily refused not only medicine, *but all sustenance*. It became necessary to confine him by a strait waistcoat ; and I directed his feet and legs to be well fomented. Three drachms of laudanum, mixed with a like proportion of olive-oil, were afterwards rubbed into them. Within the space of five or six hours he grew more calm ; *and was prevailed upon to take nearly two glasses of wine*.

“ A repetition of the inunction was directed.

[* Mrs. ——— is still alive, and continues liable to occasional returns of epilepsy. (Feb. 1809.)]

“ May 18. The patient was in a state of tolerable composure. *He had taken both wine and nutriment.* The inunction had been thrice renewed ; but, as it had not produced much sleep, I directed fifteen drops of laudanum to be administered every four or five hours, in coffee, of which he was said to be fond, and which conceals the taste of opium better than any other vehicle. The inunction was discontinued.

“ May 19. The patient had enjoyed sound and refreshing sleep ; and awoke in the morning almost perfectly rational, *with a considerable abatement of every symptom of fever.* *

Additions to Dr. Percival's Communication.

“ In the introduction of new modes of treatment, it is incumbent on the medical practitioner, to be sedulously cautious, not only that he founds his trials on just analogies, but that he conducts them with impartiality, and records, with faithfulness, their good or ill success.

“ The apparently happy effects of opium in the case of Mr P. and in the two others

[* The rapid abatement of the feverish symptoms, in this, as well as in the case of Mr. G. P. and others, which remain to be noticed, is a very remarkable circumstance, and which cannot be explained upon the idea of a mere anodyne operation.]

which I have just related, led a Physician of this town to conceive, that he should derive benefit from its external application, under a severe head-ache. To this malady he is often incident; and when he has recourse to laudanum for its relief, he generaily experiences great subsequent nausea, vertigo, and nervous debility. Being attacked with violent pain above the left eye, where the frontal ramus of the nervus ophthalmicus spreads itself, he had the whole forehead repeatedly rubbed with the following ointment:

“ R \bar{y} . Opii. purif. gr. x. camphor. gr. v.

“ Ung. Adipis Suillæ, unc. ss. M.

“ The camphor dissolves the opium, and renders the composition so smooth, as to fit it for absorption.

“ At first the unction, which was applied to a sufficiently large surface, the fore part of the head being bald, seemed to soothe and to assuage the pain. But this comfortable effect soon ceased: the head-ache continued, increased, and terminated only at the usual period.

“ The disappointment in this instance ought not, perhaps, to discourage a further trial of the ointment, at the commencement of my friend's next fit of head-ache. But the remedy is more likely to be successful, if the ointment be carefully rubbed on the inside of the legs and thighs, where the lymphatics are

far more numerous than on any part of the head. This distribution of the absorbents, may give peculiar efficacy to the anodyne inunction in painful menstruation; to which those females are generally most liable, who suffer extreme faintness, languor and sickness, from taking opium in the usual forms of its exhibition. And in the mortification of the toes, described by Mr. Pott, the same application is highly worthy of a trial, in conjunction with the internal use of laudanum: for, as opium appears to possess, in some degree, a specific action in this disease, the more fully the system can be imbued with it, without producing stupor, or injuring the energy of the brain, the greater likelihood there must be of arresting the progress of this direful disorder. In a case, about which I was not long since consulted, I observed the gangrene extended itself in streaks up the inside of the leg, along the course of the absorbents. If this method of treatment had then occurred to my mind, I should not have hesitated to recommend its adoption."

BEING impressed with the apparently beneficial effects produced by opium applied externally, in three of the instances above related, I felt a strong inclination to adopt the same

practice, in a case of chronic rheumatism of seven months' continuance, which had not yielded to the usual plans of treatment.

My principal view in this trial was, that it might probably prove a substitute for the pulv. ipec. comp., which the patient had in vain tried to wean herself from, although it had been highly injurious to her general health.

Were this point gained, I was in hopes she would be able to take a more generous diet, and tonics; without which, her recovery could not be expected.—The following is a brief statement of the principal occurrences.

May 21, 1799. Mary Caldwell, aged 34, was attacked with lumbago and sciatica, in November last; she was much debilitated and emaciated at that time, by a long continuance of menorrhagia. I was called to visit her about three months since, and found her in a very reduced state, having had very little ease or sleep for some time. She obtained temporary relief from pulv. ipec. comp. and topical applications, and has continued to take a dose of the powder almost every night, to the present time; not being able to obtain either ease or rest without it. Bark, tincture of guaicum, and calomel in small doses, were of no service, and she continued to decline in her general health, being much harassed with pain and flatulence in her bowels, costiveness, and sickness. Pul. rhei, and kali vitriolatum, were added to the powders,

but seemed to hinder their anodyne and sudorific effects. Aperient medicines of different kinds were given; but the relief procured by them was of short duration.

The powders were ordered to be discontinued, and six grains of opium, mixed with three drachms of lard, to be rubbed on the inside of one thigh, for thirty or forty minutes at bed time.

May 22. She had not so good a night as she had been accustomed to have after taking thirteen grains of pul. ipec. comp. at bed time. Twelve grains of opium, mixed with three drachms of lard, were ordered to be rubbed on the inside of the other thigh at nine o'clock to-night.

May 23. She was restless the beginning of the night, but slept comfortably from one o'clock A. M. till ten. Is better to-day than she has been for some time past: has not been troubled with sickness and flatulence; her appetite is improved; bowels regular. Pergat.

May 24. Slept but indifferently the beginning of the last night; but pretty well afterwards: appetite continues better: bowels open. Fifteen grains of opium mixed with three drachms of lard, were ordered to be rubbed in to-night an hour sooner than usual.

May 25. She fell asleep soon after the ointment had been applied, and had a good night. The same plan was ordered to be continued.

May 28. The pains are not so severe, nor do they continue quite so long when they come on ; but she seldom sleeps till towards one o'clock. I desired to see the ointment, and found the opium which had been used on the 25th. and since that time, was not powdered sufficiently fine.

The pained parts were ordered to be rubbed morning and evening, with some of the following liniment, and I desired the friction might be continued fifteen or twenty minutes at a time, that a considerable portion of the liniment might be absorbed. *R \bar{f} . Lin. Sapon. Æther. Tinct. Opii aa. unc. i. M.*

R \bar{f} . Infus. Cort. Peruv. Vin. Rub. aa. unc. vi. Tinct. Lavend. Comp. unc. i. M.—Cap. cochl. iij. larg. ter die.

June 1. She has walked out twice, and is not worse.

The ointment, each portion containing fifteen grains of opium in fine powder, was ordered to be continued.

From the facts above recited, I think I am warranted in drawing the following inferences ; *1st. That opium, when diligently applied externally, so as to be absorbed by the lymphatics, has powerful effects in allaying irritation, removing spasm, and procuring sleep. 2dly. That it is capable of producing these happy effects, where the exhibition of it internally had not the same salutary*

operation. 3dly. That this mode of introducing it into the system, may be resorted to with advantage, when it cannot be given internally, or when it will not stay on the stomach.

Viewing the subject in this light, a wide field seems to lie open for investigation, which, if cultivated, may possibly lead to important improvements in the practice of medicine.

As opium, applied externally, possesses the peculiar advantages above mentioned ; would it not be worth while to try its effects, in this way, in hydrophobia and in tetanus ?— Unfortunately the former is justly ranked among mortal diseases, and the latter generally proves fatal. Every other mode of treatment having been unsuccessful, is a sufficient reason for adopting some new plan of treatment, provided it have reason and probability to recommend it; and opium, on account of its soothing, antispasmodic properties, seems strongly and peculiarly indicated in these diseases.

But it may probably be urged, that the *modus operandi* must be the same, whether opium be given internally, or applied externally by absorption; and, therefore, as it has not been efficacious when taken by the mouth, we cannot expect it to be so when applied externally: but experience, the only true test by which to try every hypothesis, seems at variance with this: at least, the facts contained in the

cases above recited, militate as far as their authority extends, against the idea of the *modus operandi* being the same, the effects produced being so different. *

* [At the time this observation was made, the practice of applying opium externally was in its infancy, (and I am sorry to say is still far from having attained that maturity of which it is capable,) a plea which it is hoped will acquit me of any very serious blame, should it appear, that in endeavouring to explain phenomena so rare, immediately after they had occurred, and differing so essentially from those which arise from the *internal* use of this medicine, inaccuracies of expression, or even errors in doctrine, should have escaped me; due allowance being made for the difficulties which are inseparable from a pursuit of this nature.

That opium operates upon the same general principles in whatever way employed, is very certain; but it by no means follows, that the effect produced must necessarily be the same in the different modes of applying it: a fact which is fully demonstrated by the cases above recorded, (to which many others equally decisive, may now be added,) from which it appears, that instead of answering the end proposed when it was given by the mouth, it was either rejected; or, if retained, the only effect it had was to aggravate the symptoms; though it was exhibited in various forms, and under circumstances in other respects highly favourable. Yet no sooner was *the opiate friction* resorted to, than a material change for the better became evident, and was of such a kind as shewed clearly, that it could have arisen from no other cause, than from a portion of the opium having been absorbed, and carried into the blood vessels.

The point to be determined then, is; upon what causes do the great and striking differences, observable in these opposite modes of administering this medicine, depend? But this is a question of too complicated a nature to be discussed

Another strong argument in favour of the external application of opium in hydrophobia, is, that should it be found to be possessed of properties capable of counteracting the effects of the virus, it will be of peculiar advantage, that we can introduce it into the habit by the same system of vessels which convey the virus into the circulation: and it is worthy of consideration, that should my hopes and expectations of success be disappointed, it does not seem probable that any mischief can be done by this practice.

But whether opium applied externally, may or may not prove an antidote to the canine virus, it would, I think, be unpardonable to rely exclusively on those plans of treatment, which have been so often tried, and always without success.

Whoever may think proper to make trial of this mode of treatment, should see that the powder, if that be preferred to the tincture,* is made as fine as possible, and that it is rubbed in, in large quantities,† (the disease being so violent and so rapid in its progress) on the in-

here. I must therefore content myself, for the present, with referring to the 7th., 8th. and 9th. volumes of the Med. and P. Journal, in the pages mentioned in the Introduction.]

* Would it not be adviseable, till we know which of these preparations is absorbed with the greatest facility, to use both, either alternately, or together?

† Not less than a drachm of the powder, or an ounce and a half of the tincture, to an adult subject.

side of the legs and thighs, and also on the part where the bite was inflicted in hydrophobia, or a wound in tetanus; repeating it at short intervals, * *till it produces some sensible effect on the system in general.*

That the other parts of the treatment may coincide, as far as possible, with the soothing plan here proposed, it will be necessary to keep patients labouring under hydrophobia or tetanus as quiet as possible, and to avoid every thing which can tend to agitate and alarm, excite uneasy sensations, or bring on a return of the spasms. In conformity to this intention, instead of importing the unfortunate sufferer to swallow medicines, or liquids, of which he has so great a dread, clysters might be given every three or four hours, perhaps with advantage, to support the strength, consisting of good broth, or milk, with thirty or forty drops of laudanum in each. Should the patient ask for food or drink, warm milk or jelly, or mulled wine, may be given from a tea-pot spout; but on no account ought liquids to be brought into his sight, or to be disturbed or agitated in his hearing. For similar reasons, I should think it improper to ask the hydrophobic patient any questions respecting the dog, or the bite. He should be carefully guarded against the effects of cold air, (some patients having expressed almost as great

* I should imagine an hour would be a sufficient length of time, to allow to intervene between the frictions.

an aversion to a stream of cold air,* as to liquids), by wearing a flannel shirt next to his skin, and by wrapping his legs and feet in warm flannel, or putting him on woollen stockings, and by warming his apartment moderately with a fire or a stove. If it be necessary to remove him to a hospital, or elsewhere, after the coming on of the disease, he should be warmly clothed, and removed as easily and carefully as possible.

Should experience shew, that the plan here proposed is capable of curing, *or even of mitigating the sufferings of this unfortunate class of patients*, a most valuable accession to medical knowledge will be gained; but we ought not to be satisfied with a few trials of this practice, I think, should the result be unfavourable.

Manchester, June 12, 1799.

* [This is the Cærophobia of Authors.]



NO. II.

From the Medical and Physical Journal. Vol. 2.

p. 6.

.....

*Additional Facts and Observations relative to
Opium applied externally, so as to be absorbed
by the Lymphatics.*

HAVING endeavoured to excite the attention of medical practitioners to this interesting subject, it appears to be a duty incumbent upon me, to communicate any farther cases or observations which may occur to me, tending either to elucidate or extend the practice.

The following, I trust, will not be deemed entirely unworthy their attention.

June 7, 1799. John Jackson, æt. 53, was admitted into the Infirmary, with a simple fracture of the tibia and fibula of the left leg. An eighteen-tailed bandage, moistened in aq. litharg. acetat. comp. was applied, and the limb was placed on its outer side, with the knee bent. He was unusually loquacious whilst we were reducing the fracture. A low diet and a laxative medicine were prescribed.

June 11. He has had very little sleep last night, and was found this morning in a maniacal state, lying across the bed without any of the

bandages upon his leg. He talks incoherently: his tongue is white, and his countenance flushed: pulse 108 and soft. Circular rollers steeped in aq. lith. acet. co. were applied upon the limb; and as soon as a strait waistcoat could be procured, he was placed on his back, and his leg was confined in a fracture box, of such a construction as to allow his knee to be in a bent position, and the limb to be raised. His leg was secured in the box, and the potus acid. vegetab. directed to be drank ad libitum.

June 12. *He found means in the night to extricate himself from the strait waistcoat, and has been so noisy the two last nights, as to disturb the patients in the neighbouring wards; he never ceases talking; generally mutters to himself; but sometimes is extremely noisy: his eyes are blood-shot, a constant tremulous motion prevails in every part of his frame: his tongue and gums are much furred (the former has brown streaks upon it); pulse 120.*

R $\bar{7}$. Amon. præp. gr. xv; pulv. cort. peruv. scrup. i; tinct. opii. gutt. v. syrup. sacchar. dracim. i; aq. cinam. drachm. ii; aq. pur. drachm. vi. — M. f. haust. quarta quaque horâ sumend. in effervescent: cum suc. limon. recent. unc. ss.—Contin. potus.

I visited him again at nine in the evening. He had taken two draughts. The tremor and delirium had not abated; I therefore directed the following liniment to be rubbed into the inside of his

right thigh immediately, and to be repeated in four hours, unless sleep was procured :

Rj. Opii. pulv. subtil. drachm. ss. camphor : gr. iv. adip. suil : scrup. iv. ol. olivar. drachm i. M.—*

June 13. *He slept well the whole of the last night, the tremor is gone and he is easy, composed and rational : his thirst is abated ; but his tongue continues white : appetite good, pulse 88.*

The strait waistcoat was taken off: he has no complaint left, except a slight mazziness in his head. Two portions of liniment, each containing half a drachm of opium, were applied.

He has been harassed with a great variety of incongruous ideas since the delirium came on ; but that which seems to have made the strongest impression is, his imagining himself to have been conveyed with incredible velocity, from one eminence to another. It will be unnecessary to continue the journal regularly. It did not seem safe at once to discontinue the opium : one portion of liniment was therefore rubbed in every night for three or four times ; but each portion contained a smaller quantity of opium than the preceding.

On the 14th. in the morning, his pulse was 92 and regular ; in the evening 80 ; 15th, 84 ;

* This formula seems to be absorbed with more ease than any other I have yet tried : but one drachm of lard, and half a drachm of oil is sufficient, where the opium does not exceed a scruple and a half.

16th, 76; 17th, 84; 19th, 80. Before the first portion of opium was applied, his pulse fluctuated between 100 and 120. July 4. His leg is as straight and as firm for the time, (28 days) as any fractured limb I ever saw, which is surprising, considering how extremely restless, and untractable, he has been.

The mania has returned at intervals since the 20th. ult. and he has taken two grains of opium every night lately, with apparent advantage; but has often been confined since the 20th. by the waistcoat in the night, and liberated in the day time. *His appetite has been insatiable since the 18th. ult.* Only one person has visited him since his admission, and she is ignorant of his previous history.

To guard against the indiscriminate application of opium externally, by absorption, in delirium accompanied with fever, it may be proper to observe, that in a recent instance of typhus, where petechiæ, a livid appearance of the eschar occasioned by a blister, stupor, and an involuntary discharge of bloody urine, had taken place, and the patient had been delirious and had had very little sleep for some time, a scruple of opium was rubbed into one thigh; (15 grains had been rubbed in six hours before, and ten grains twelve hours before, without producing any sensible effect). The next day the patient was affected with coma, which went off in about 24 hours.

The stupor and putridity which prevailed in the system before the opium was employed, were probably amply sufficient to account satisfactorily for the occurrence of this symptom; but still, the external application of opium, except in small quantities, when there is any tendency to coma, seems likely to be ambiguous, if not hurtful in its effects.

Mary Caldwell * did not seem to derive any material advantage from a continuance of frictions with opium; they were therefore discontinued; but they enabled her to leave off taking the pulv. ipecac. comp. which could not be accomplished till she had recourse to them. Since that time she is become an home patient to the Infirmary, and was no better the last time I heard of her.

Dr. Percival informs me, that since his last communication to me, he has tried the *external* use of opium in a *chronic dysury*, and in a case of the *stone in the bladder*, with *very considerable ease to the patients*, and *without producing the vertigo, head-ache, and obstinate costiveness, which the internal use of laudanum had before occasioned.*† He has suggested to me the following queries.

* See No. I.

† Two or three years afterwards, this much lamented Physician informed me, that the Stone-Patient whose case is above alluded to, derived great and *permanent* benefit, and had his life apparently prolonged, by the *external* use of opium, as he was thereby enabled nearly to discontinue taking that medicine *internally*, which had greatly injured his appetite and

1. What is the smallest quantity of unguent required for combination with the opium, so as to render it readily admissible into the body? To ascertain this point, might tend to facilitate and shorten the operation of inunction.

2. Would the oleum e pedibus bovinis, or neats' foot oil, which, being remarkably lubricating, may be supposed to pass readily into the pores of the skin, be a commodious vehicle for the opium?

3. Would opium, combined with the yolk of an egg, gain a readier admission into the body, than with an oily substance? *

Manchester, July 12, 1799.

health. He also intimated that he had prescribed the opiate friction with success, in various instances of disease, besides those above related; but after the testimonials which had appeared in its favour, he thought it unnecessary to publish them.

[* In answer to these queries it will be sufficient to observe, that the smaller the quantity of unguent, the better, provided the whole be made so smooth and soft, as not to occasion any uneasiness by its tenacity in applying the necessary degree of friction. Four or five parts of axunge, (which is preferable to any other kind of ointment on account of its being more readily absorbed) to one of opium, and one or two of olive oil, are sufficient for this purpose.

It does not appear, however, that any great degree of nicety is requisite on this head, provided the opium be powdered sufficiently fine before it is mixed with the other ingredients. The tincture of opium combined with an equal

quantity of olive oil and yoke of egg, or with a third part of *linim. saponis*, has, on many occasions, been found very convenient and efficacious for outward application; but the tincture alone, rubbed into the skin of the arms, has produced more *speedy and powerful effects* than any other preparation I have tried. In several cases of *hysteria*, and one of *epilepsy* accompanied by maniacal fury, it acted like a charm, in removing the convulsions both of the muscles and ideas, almost instantaneously; at a time too when their violence was such as to require the assistance of three or four persons to prevent the patients from injuring themselves, or others: and when the jaws were so completely locked, as to render it impossible to give any kind of medicine, or food, by the mouth.

For these reasons, and because we cannot always depend upon the powder being made so fine as it ought to be, I generally prefer the tincture, either alone, or combined as above.

Experience also enables me to say, that those hysterical patients who have been treated in this manner, have suffered incomparably less inconvenience from head ache, debility &c., and have been restored to health in a much shorter time after the spasms have been subdued, than when the disease has been treated in the common way. And the reason is evident. In the former mode, the remedy can at all times be conveyed into the system by the absorbents, during the continuance of the most violent paroxysm, without the smallest annoyance to the patient; whilst in the latter we are often obliged to wait till the paroxysm has gone through its course, (when the patient is generally exhausted by the violence of the spasms,) before any remedies can be got down. But supposing the obstacles were equal in the different methods of cure here implied, still I would maintain that the opiate friction, if employed in the exacerbation, has a decided superiority over *internal remedies*.

The method I have pursued has been simply this. To direct from three to six drams, (according to the age of the patient, and the severity of the attack,) of the tinctura

I SHALL embrace this opportunity of paying a tribute of respect, to the memory of that able Physician, and excellent man, the late Dr. Percival, in the following brief, but imperfect, sketch, of his character.

Uniting skill with humanity * in the dis-

opii, to be rubbed upon the insides of *the arms* between the wrist and shoulder, *until the whole is absorbed*; which has commonly been succeeded in the course of a quarter or half an hour, sometimes sooner, by a remission of the spasms, and composure of body and mind. (Had not relief been obtained, I should have directed the same quantity of the tincture to be rubbed into the shins, but this has not hitherto been requisite.)

As soon as the jaws become free, antispasmodics may be given internally, and afterwards tonics, chalybeates, &c., as occasion may require. But these have commonly been unnecessary, as I have generally found the patient the next day complaining only of a slight head-ache, and soreness of the limbs, which have required little or no additional aid from medicine.]

* A noble act of benevolence not generally known, but which places his character in a very amiable point of view, was related to me, with tears of gratitude, by the person upon whom it was conferred.

Its authenticity being thus established, I should scarcely think myself justified in withholding it from the public.

The daughter of a respectable shopkeeper was attended by the late Dr. Percival, in a long and tedious illness, of which she at length died, to the great distress of her parents, who, though they had several other children, were particularly attached to this, their only daughter. Soon after her decease, the mother had to mourn the loss of her husband, who was suddenly, and unexpectedly cut off; and she was left a widow

charge of his professional duties; polite and affable in his manners; punctual in business, and cautious in the extreme not to injure the reputation, or hurt the feelings, of his medical brethren; his whole conduct might justly be said to be one continued exposition, of his own admirable code of medical ethics.

In the performance of the offices of President of the Literary Society, Physician Extraordinary, and Chairman of the medical Committee, of the Infirmary, his behaviour was uniformly such, as to entitle him to the most unqualified praise. On these occasions, indeed, he appeared in a peculiarly advantageous light.

With a mind habitually candid, cultivated by learning, enriched by science, and enlarged by experience; sincerely devoted to the cause of truth, and superior to narrow prejudices; seldom has a larger assemblage of the requisite qualifications been found united in the character of an individual, than in his, of whom I am

with three children, the eldest of whom was a cripple: At Dr. P's. next visit, Mrs. ——— was expressing her gratitude, for his kindness, and attention, to her daughter; and at the same time her fears, that it might not be in her power to reward them as she wished, and his services required; but requested to have a note of his demand. This she estimated at £50; but I imagine that sum must have fallen far short of its real amount. He desired Mrs. ——— not to be uneasy on that account, as he did not intend to be paid for what he had done. In a few days after this conversation had taken place, he called again, and made her a present of twelve guineas.

speaking : For in addition to those which I have already enumerated, there was something so dignified, yet conciliating and unassuming, in his manners and deportment, as seemed to give a grace to all he uttered, and to carry conviction to the mind, as well as to accord with the feelings, of every person present ; as must be perfectly in the recollection of many gentlemen, who were in the habit of attending these meetings.

Thus endowed, he became eminently qualified for the station in which he was placed ; that of being at the head of the profession, in a large, rich, and populous town, and county.

Here it would be easy to enlarge upon his meritorious exertions, as a member of the Committee of the Board of Health, instituted in 1796 for the purpose of establishing the Fever Wards, the good effects of which are now generally acknowledged, in which capacity, he took a very active and conspicuous part : as indeed he did, on all occasions, where the public good was to be promoted. And I should have had great pleasure in dwelling upon this part of his character, if it were not rendered unnecessary, by the able and satisfactory account of his life and writings, which has been lately published by his son.* I shall therefore only observe, that he was

* *Memoirs of the Life and Writings of Thomas Percival, M. D.* By Edward Percival, M. B.

a regular attendant at these meetings, where he communicated not only the result of his own matured reflection and experience, but that of his medical and philosophical correspondents, which he was at great pains to collect; cheerfully submitting to the obloquy which attached in a greater or less degree, to all those, who were anxious for the success of the scheme, and assiduous in endeavouring to promote it.

Honoured as I was by his acquaintance, and I believe I may add, with some small share of his friendship, his death caused a sensation in my mind, as great, as if I had lost some near and dear, relative.

With regard to the public, the only light in which this event can be considered, is, as a loss to the community at large, and such an one, considered locally as well as generally, as cannot be expected to be easily, or speedily, supplied.

July 24, 1809.

THE following case coming from a man of long experience and considerable acquirements, as a medical practitioner, a chemist, and a philosopher; cannot fail to excite a corresponding interest; and I am happy to have an opportunity of publicly expressing my obligations to its author, for the candid manner in which the communication was made, as well as for the friendly, but flattering, terms, in which it is expressed.

NO. III.

*From the Medical and Physical Journal. Vol. 2.
p. 103.*

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TO THE EDITORS.

“ Gentlemen,”

“ ONE great advantage of your valuable publication is, that it admits of the communication of practical facts, the knowledge of which may be useful to medical men, without the necessity of entering into long details, for which few practitioners have time or inclination.

“ It is with pleasure I am able to bear testimony to the good effects of the opiate friction, as recommended by my worthy friend, Mr. WARD, in the fifth number of your Journal.

“ A young lady of about thirteen years of age, much harassed with ascarides, had been

removed, on the death of a brother by typhus, from this town to Warrington. In a few days, symptoms of typhus attacked her; but instead of proper measures being taken, she was encouraged to walk out; and growing worse, her friend, with whom she had been placed, brought her on the tenth day of the fever, twenty miles in a stage coach to her parents. On the evening of this day, July 28th., I visited her, and found her in a state of great irritability, with a rapid pulse, considerable heat, and fallen countenance; her bowels being constipated, she was with great difficulty, prevailed on to take a powder consisting of calomel and James's powder, of each one grain, rhubarb and opiate powder, of each four grains: this procured three loose stools, in which a great number of ascarides were discharged: she now, with a degree of obstinacy I have seldom witnessed, protested against taking any medicine, or even any appropriate food. On the thirtieth, a diarrhœa prevailing to an alarming degree, ten drops of laudanum, concealed in a cup of coffee, were given without her knowledge; and this single dose was the only medicine which, during three days, we were able to administer. She was sinking fast, her pulse very rapid and feeble, and she had a tendency to delirium. Wine, which in this state, seemed highly requisite, she positively rejected; and I despaired of being able to succeed by internal means.

therefore resolved to try the external application of opium. The following ointment was directed to be divided into two parts, and one of them to be rubbed into the thigh of the patient, by an assistant, whose hand was ordered to be covered with a soft bladder:

R Opii subtilissime pulv. scrup. i.

Adipis suill. drachm iij.

Camphor. scrup. ss. M. et divide in chartulas duas.

“ This application seemed to have some sedative effect, and was therefore repeated in the evening. The next morning, August 1st., I had the satisfaction to find that she had had some comfortable sleep; but the looseness recurring, we contrived to convey ten drops of laudanum again in coffee. The ointment, with an increase of ten grains of opium, was continued, and as she appeared more composed, I determined to abide steadily by it. The good effects were each time more evident; sleep almost constantly followed the application of the ointment, though no more laudanum was given internally; her pulse and the intensity of heat were gradually reduced, the diarrhœa was stopped, and on the fourth day from the commencement of this treatment she began to take some wine, acidulated with sulphuric acid. The friction on different parts was persisted in till the 8th. of August, inclusively;

when the urine having, for the two last days, deposited a proper sediment, and every symptom of fever having disappeared, it was discontinued.

With much respect, I am,

Gentlemen,

Your obedient servant,

THOS. HENRY." *

Manchester, Aug. 17th., 1799.

NO. IV.

*From the Medical and Physical Journal. Vol. 2.
p. 106.*

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TO THE EDITORS.

Gentlemen,

THE following communication I have received from Mr. BARLOW, surgeon, at Bolton.

As Mr. B. alludes to a subject which has appeared in the Medical and Physical Journal, and the case he relates is of considerable *practical* importance, I shall be glad if you will give it a place in the next number of your useful publication : and am,

Your very humble servant,

M. WARD.

Manchester, Aug. 11, 1799.

[* The young lady who was the subject of this case is now living. March 1809.]

SIR,

“ Agreeably to your request I send you the annexed case, which you are at liberty to publish or not, as you may think proper.

“ I did not keep a journal of the case, which will account for my not mentioning every minute particular.

“ Esther Knowles, aged 49, was suddenly attacked about the middle of last June, with a shooting pain on the inside of her right thumb, near the second joint. The pain did not continue long; but about the eighth day it returned, and a purple blister appeared upon the part, about the size of a small pea.

“ Not thinking it of much consequence, she allowed a week to elapse before she consulted me. The whole arm was swelled, particularly along the course of the lymphatics, as high as the axilla, where there was a tumour of the glands. The ulcer, which was about the breadth of a shilling, continued spreading, and had a gangrenous appearance; the pain was excessive, and as she expressed herself, shot from her thumb to her heart.

“ I ordered leeches to be applied to her arm, and also a fomentation of poppy-heads, and a common poultice, morning and evening.

“ On the following day, the inflammation was considerably abated; but the pain continued, and the ulcer looked no better.

“ I gave her opium, both in the solid and liquid form, with as much bark and wine as her stomach could bear, which she took a week without much abatement of the pain; the ulcer still spreading. She was then so weak and faint, that she could not come to me to be dressed, as usual.

“ I visited her the next morning, and found her in bed, her stomach rejecting every thing she took, whether food or medicine; and if she raised her head, she fainted.

“ Having lately read your paper in the Medical and Physical Journal, on the effects of opium applied externally, so as to be absorbed by the lymphatics; and thinking that plan of treatment worthy of being tried in the present case, I directed a liniment, with six drams of tincture of opium and an equal quantity of olive oil, combined by the yolk of an egg; the whole of which was rubbed on the inside of the patient's legs and thighs, at three times in the course of the day.

“ The next morning she was easier, and the ulcer did not appear to have spread.

“ The frictions were continued five days longer, with an ounce of the tincture of opium each day; during which time the pain left her, and the ulcer looked better every day.

“ *As she had by this time tolerably recovered her appetite and strength, I only saw her occasionally, and gave her, now and then, an opium pill at night.*

“ The pulse from the time I saw her, was low, and not remarkably quick. ”

I am, Sir, yours, &c.

J. BARLOW.

Bolton, August 10, 1799.

NO. V,

*From the Medical and Physical Journal. Vol. 3
p. 102.*

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TO THE EDITORS.

“ Gentlemen, ”

“ THE success which attended the use of the opiate friction in several cases related by Mr. Ward, of Manchester, induced me to try it in the following, wherein it was attended with the most beneficial effects. If you think it worthy a place in your valuable Journal, you are at liberty to insert it.

I remain, Gentlemen,

Your very humble servant,

THO. DOCKER, Surgeon to the Forces. ”

Deal, December 22, 1799.

“JOHN BAYLEY, of the Third Regiment of Guards, was received into the Military Hospital at this place, from Holland, as a venereal patient. Upon examination I found a considerable sphacelation in the groin, from a bubo which had been opened some time. It was then rapidly increasing, and from the general state of his health, I had every reason to fear a fatal termination. The part was ordered to be fomented, and the carrot poultice applied; he had cordials with bark and opium prescribed, and as much wine as he could take; but notwithstanding, *the sphacelation still continued to advance.* — Oct. 12. This morning I found him extremely ill, the attendants thought he would have died in the night. His stomach rejected every thing he took; *his pulse could scarcely be counted*; a diarrhœa had come on, and his groin presented a most shocking appearance. I concluded that a few hours would have terminated his existence. It now occurred to me, that opium, *introduced by friction*, would, probably, be attended with advantage, and I determined to try it as the last resource. I accordingly directed the following to be immediately rubbed into the thighs and legs.

Tinct. opii 3ij. Camph. 3 ss,

Ol. oliv. 3ij. vitel. ovi q. s. M.

“I visited him a short time afterwards, and found him, I thought more composed, and less languid, *and he had taken some wine without*

sickness. I directed the same quantity to be used again, and to be repeated in the course of the night, with the addition of one drachm of tinct. opii. Oct. 13. This morning evidently better, had passed the night with some sleep, and the inflammation about the edges of the ulcer considerably abated; the diarrhœa had also stopped. I directed three drams of the tinct. opii to be used three times in the course of the day. I saw him in the evening; *he had taken a good deal of wine and some soup without any sickness*, and his pulse was better; four drams of tinct. opii were ordered to be used during the night, 14th. This morning he appeared in a progressive state of recovery, though he had slept but little, and perspired profusely; but he had had a regular stool, and the inflammation about the edges of the ulcer had stopped, and its surface looked less gangrenous. I directed four drachms to be rubbed in every five hours. 15th. A good deal of composed sleep during the night; the inflammation and spreading entirely stopped; the slough separated from the sound parts, and the ulcer now looked quite clean. He has taken a little wine during the last twenty-four hours, *and eat some fish with appetite*; the friction continued. 16th. Slept the greatest part of the night, and awoke greatly refreshed; friction continued. 17th. The carrot poultice omitted, and the ulcer treated with simple dressings; the friction continued, and

he was directed to take some infusion of bark. 19th. As the bark had created nausea, I ordered it to be omitted; and as his health and *appetite* now rapidly improve, I diminished the opium one third. 24th. *He has now a very good appetite,* and the ulcer heals rapidly; the opium diminished one half. 27th. The opiate friction entirely left off, and he is directed to take the decoction of bark, with elixir of vitriol. Nov. 13th. The ulcer is now almost healed, and he is, in other respects, in perfect good health."

NO VI.

*From the Medical and Physical Journal. Vol. 6.
p. 17.*

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TO THE EDITORS.

" Gentlemen, "

" I transmit you the inclosed case for your valuable Journal, if you should deem it worthy of insertion. I am, &c.

E. PITTS GAPPER."

Ewel, Surry, June 9, 1801.

“ On the 3d. of April I was desired to visit a young man, of a scrophulous habit, who was ill of an inflammatory affection of his lungs, which was accompanied with the usual symptoms of cough, fever, &c. But as the disease itself did not differ in its appearance from what is generally observed, until the symptom which is the subject of this paper came on, I do not think it necessary to detail its progress, only premising that he was bled twice, that the blood was inflamed, but not highly so; that blisters were repeatedly applied to the thorax, and that antimonial, saline, and aperient medicines were administered, as circumstances required, with a strict attention to an antiphlogistic regimen, though without any apparent advantage being gained by it.

“ On the 19th. he was seized with a hiccup, the most violent, distressing, and incessant I ever witnessed; it was loud enough to be heard in the street at the distance of several yards from the house, and continued without even ceasing a single minute for near *eighty hours*, before any relief was obtained. The pulse, during this period, was small, and fluctuated from 120 to 130 in a minute, I was not remiss in employing whatever remedies I judged most likely to be of service. Musk, assafoetida, amber, æther, volatiles, and opium were given, variously combined, at short intervals, and in considerable doses. A large blister was applied

to the region of the stomach, and fomentations to the feet. At the end of the above-mentioned period not the least abatement could be perceived, the hiccup continuing as loud, as violent, and as incessant as ever. I began now to despair of my patient; when, as every thing else had failed, it occurred to me to employ opium by friction, in the manner I had seen it recommended in your useful Journal, in cases of delirium attendant on typhus fevers. I therefore ordered, on the evening of the 21st., two drams of tinct. opii, mixed by means of a little yolk of an egg, with the same quantity of oil of almonds, to be rubbed into the thighs, and to be repeated every eight hours. Care was taken by my assistant that it was properly done, and that the friction was continued until the whole was absorbed. When I saw him the next morning the liniment had been twice used, and I was much pleased to find with some effect. He was much more composed than on the preceding night, and though the hiccup was still as frequent as ever, yet it was less violent and loud. The pulse was also reduced to 112. Encouraged by these flattering circumstances, I ordered a continuance of the liniment. On the morning of the 22d. he was in much the same state as on the preceding day: but, in the evening, I was happy to find that intermissions, though short ones, had taken place. On the next day, the 23d., the inter-

missions were increased in frequency, and were extended to the length of half an hour or more; and the pulse was reduced to 90. The liniment was continued as before. From this time the hiccup became less frequent and violent, and the intermissions longer, until the 25th, when it wholly left him. The remainder of the case, as not being connected with the subject, it is unnecessary to relate; it is sufficient to say that my patient ultimately recovered.

“ During the use of the liniment he took no other medicine than the simple saline draught, *and so far from the bowels becoming constipated under its use, it was not even necessary to give him any aperient medicine during its exhibition.* It occasioned a considerable degree of drowsiness, but not in any degree to excite the least alarm. The quantity of tinct. opii used was two ounces in the space of little more than three days; a quantity which could not have been exhibited in any other way without the most imminent hazard and danger. Such a wonderful effect as is here related, naturally leads the mind to speculate on the *modus operandi*, and to discover why a certain quantity of opium may be conveyed into the system through the absorbents, not only without detriment, but with great and decided advantage, which if admitted into the stomach would probably occasion death. I shall not enter into such a disquisition, as many and repeated experiments, and much reflection, are

necessary to give a satisfactory explanation. I shall only be happy if, in similar circumstances, it may prove as efficacious in other hands as it has done in mine."

NO. VII.

*From the Medical and Physical Journal. Vol. 6,
p. 387.*

.....

TO THE EDITORS.

" Gentlemen, "

" IF you think the following case worthy a place in the M. and P. J. it is at your service.

I am, &c.,

W. WHITE. "

Bath, Oct. 10, 1801.

" Sept. 12. Eliz. Hall, ætat. 33, was seized five weeks ago with a chilliness, pain of her bowels and head. Three or four days after, a nausea and vomiting came on, (of a yellow colour and a bitter taste) accompanied with a diarrhœa. She was thirsty, skin hot, pulse quick, tongue white, had sweatings at night. Some calomel, and a saline cordial mixture, were prescribed for her; and, in the course of

a fortnight, she appeared mending for three or four days. The sickness and vomiting however returned again, with stitches in different parts of the chest, and considerable oppression at the præcordia, greatly interrupting respiration. Notwithstanding every attention was paid to her, the complaint increased, and she was now so extremely reduced, that persons around her frequently thought she was expiring. *Nothing had stayed on her stomach for several days, either of food or medicine. The vomiting was æruginous; she had singultus often; frequent loose motions, of a dark colour; pulse very feeble and quick; tongue florid, smooth, and shining; she was perfectly sensible.*

“ In this deplorable situation, I directed her stomach and bowels to be fomented with a decoction of camomile flowers, and afterwards a liniment formed of half an ounce of tincture of opium, and a yolk of an egg, one half of which was rubbed on the abdomen* at two o’clock, p.m. and the remainder at bed-time. *What is very remarkable, she never was sick, nor vomited after the first friction, but fell asleep immediately on the application of the opium, and slept for some time.* The fomentation and friction were continued a few days, gradually decreasing the quantity of opium; and as her

* The liniment could not be applied immediately to the region of the stomach, as she had a blister on three or four days before, which was not quite healed.

stomach could bear it, a little wine was frequently given. It may be observed, that not only the vomiting ceased, but the diarrœa also; and she had no complaint afterwards, except a slight pain of her legs. Her pulse was reduced to 96 on the third day, which before was exceedingly quick.

“ She is recovering her strength very fast. ”

NO. VIII.

*From the Medical and Physical Journal. Vol. 6.
p. 431.*

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TO THE EDITORS.

Gentlemen,

I shall be glad if you will give the following communications a place in the next number of your useful publication.

To my ingenious friend, Mr. Jenkinson, late House Surgeon to the Manchester Infirmary, an apology is due for the delay, his letter having been in my possession nearly two years. The second communication, which I have been favoured with by Mr. Boutflower, deserves particular attention, as it corroborates an idea suggested in my first paper on the opiate friction,

where I endeavoured to show the expediency of giving it a fair trial in tetanus and hydrophobia. At length an instance of tetanus has occurred, in which it has been made use of, with the most decisive and beneficial effects; and the event having proved favourable, it will probably be the means of inducing others to have recourse to it in tetanic affections, (and I wish I could add in cases of hydrophobia,) by which means alone, its efficacy or inefficacy, can be fully and fairly appreciated. But I shall refrain at present from farther comments, as I am preparing a few observations on this subject. Allow me to add, that the tincture of opium appears to be, in general, better adapted for external use than the powder; yet, I think particular cases may occur, where the powder will be found preferable to the tincture: as, for instance, where it may be necessary to join an opiate with a portion of Ung. Hydrargyri, (a useful addition where the *mercurial friction* has a tendency to produce spasms and pain in the bowels, diarrhœa, &c:) besides that the tincture does not unite so well with the ointment, the quantity generally used of the latter, will not imbibe enough of the former, to answer the intended purpose.

I remain, &c.,

M. WARD.

Manchester, Oct. 2d., 1801.

CASE I.

Communicated by Mr. Jenkinson.

“ Betty Richards, ætat. 14, was admitted into the house on July 8, 1799, in a state of great debility, arising from the ravages which a caries of the hip, assisted by the misconduct of her master, had made in her constitution. She had been troubled with diarrhœa for several weeks; and a few days after her admission, a vomiting came on. Opiates, astringents, and aromatics were prescribed, and administered in conjunction with a proper and nutritious diet and wine, without checking either the vomiting or looseness; opium was likewise administered, clyster-wise, in starch mucilage, by which the looseness, but not the vomiting, was restrained for a time, and for a time only. Three drams of tincture of opium and one of linimentum saponis, were now ordered to be rubbed into the shins, night and morning; and all other medicines omitted. *The first portion produced a good night, though she had scarcely slept at all for the last week; and the vomiting disappeared till towards morning, when the effects of the opium had ceased. The second portion and every other, for several days, had the same effect as the first; but it was now found necessary to increase each portion of the tincture to half an ounce. By*

this plan the vomiting and diarrhœa were, the one effectually prevented, and the other much lessened, *while food* (which had, previously to its adoption, never remained with her for more than a few minutes) *was both sought for and retained.*

“ Her situation was such as to preclude all expectation of recovery; but her life was certainly rendered more comfortable, and her existence prolonged several days.

“ JOHN JENKINSON.

Manchester Infirmary, Nov. 3, 1799.

CASE II.

Mr. Bouflower's Letter to Mr. Ward.

“ Dear Sir,

“ As the following case bears testimony to the good effects of the opiate friction, recommended by you in the 5th. number of the Medical Journal, I have much pleasure in sending you the particulars of it.

“ John Mortice, ætat. 13, had the misfortune to be thrown under the wheel of a rope manufactory, by which the teguments and tendons of his left leg were much lacerated, and the tibia laid bare to a considerable extent. On being called to him immediately after the acci-

dent, I brought the edges of the wound together by means of the interrupted suture, and applied a bandage. The next day he was tolerably easy. On the 4th. I removed the dressings, and was surprised to find the appearances not so favourable as I could have wished; the lips of the wound had assumed a dark colour; there was a considerable tension and swelling of the limb, which rendered it necessary to remove the ligatures. A common poultice was now directed to be applied, and at my next visit I had the satisfaction to find the sore looking better; a separation had begun to take place of the discoloured parts, the swelling was lessened, and every thing indicated a favourable prognosis. These flattering appearances, however, did not continue long; in a day or two he complained of a stiffness and rigidity of the muscles of the neck; he had pain when he attempted to swallow, and the new granulations of the wound had changed from a bright to a pale colour.

“ From these symptoms, I did not hesitate to consider the case as an approaching locked jaw; I therefore directed him to take a grain of opium every six hours; to be allowed as much wine as he could drink; and, at the suggestion of a friend, spirits of turpentine were applied to the wound, with a view of exciting inflammation. On the three following days he continued to grow worse; his jaw was stiff, more closed, and would only admit the edge of a tea

spoon: he could not raise his head from the pillow without assistance; and when done negligently, gave him violent pain, and brought on convulsive motions of the whole body, of the kind termed *Opisthotonos*. He sweated profusely, and the opium he had taken procured him no sleep; his pulse, during this time, was slower than natural; no inflammation had been excited in the wound from the application of the turpentine; indeed, a striking insensibility was peculiarly manifest, as he felt no pain when it was dressed.

“ I was now induced, from the success of some trials you had made with the opiate friction, to try its effects in this case. Half an ounce of laudanum, combined with two drams of oil and the yolk of an egg, was therefore directed to be divided into two equal portions, one of which was rubbed into the thighs night and morning. No internal medicine was given under this plan except two grains of opium at bed-time. For some days the symptoms continued with very little change or abatement; he kept his ground, at least, if he did not get much; the rigidity every where remained, and had extended to the injured leg. — On the 6th. or 7th. day (for I do not write from notes) after the application of the liniment, he was evidently better; had slept two or three hours in the night, which he had not done since his first

attack ; the jaws were strikingly more separated, and I observed on moving him on his side to dress his leg, it was done with much less difficulty than before. From this period his recovery was gradual, and he went on so well from day to day, that I did not consider any thing necessary for him *except nourishments* ; the application of the liniment was therefore discontinued, and his recovery trusted to the opium, which he had regularly taken at bed-time. I had very soon reason to repent of the alteration I had made, for my patient not only made little progress after the frictions were laid aside, but actually appeared to be growing worse again ; I was therefore obliged to give directions for them to be re-applied, which was done with manifest advantage, till every symptom of tetanus had completely vanished.

I am, &c.

J. J. BOUTFLOWER."

Salford, Sept. 22, 1801.

NO. IX.

*From the Medical and Physical Journal. Vol. 6,
p. 478.*

Observations on the Effects of Opium applied externally.

" IN the introduction of new modes of treatment, it is incumbent on the medical practitioner to be sedulously

cautious, not only that he founds his trial on just analogies, but that he conducts them with impartiality, and records, with faithfulness, their good or ill success."

In the latter part of my first paper on the frictio opiata, I took the liberty of suggesting such inferences, as appeared to be deducible from the experience I had then had, of its effects; namely, 1. That opium, when diligently applied externally so as to be absorbed by the lymphatics, has powerful effects in allaying irritation, removing spasm, and procuring sleep. 2. That it is capable of producing these happy effects, where the exhibition of it internally had not the same salutary operation. 3. That this mode of introducing it into the system may be resorted to with advantage, when it cannot be given internally, or when it will not stay upon the stomach.

Considering the above as incontrovertible facts, I could not avoid indulging a hope, that some benefit might probably arise from this mode of introducing opium into the system in hydrophobia and tetanus; and the more I reflected on the subject, the stronger was my conviction that the misery and danger attendant on these fatal maladies could not be increased by this practice; which is more, I fear, than can

be said of the present methods of treatment, in hydrophobia especially. It is true, I was unable to adduce positive evidence in support of my opinion; but the following considerations seemed sufficient to show there was nothing improbable in the idea I entertained, and that it was not so wholly destitute of foundation in rational theory, as might at first sight appear. With this view, I mentioned, 1. The strong indications in favour of employing opium in these diseases; 2. The frequent inability of swallowing either food or medicine; 3. The violent (and sometimes fatal) spasms, which are excited by almost every effort of that kind *; 4. The peculiar advantage should opium prove an antidote to the canine virus of introducing it by the same system of vessels which convey the virus into the circulation †; 5. The inefficacy of every plan of treatment hitherto tried.

After endeavouring to obviate such objections as might be supposed to arise, from its appearing probable that the *modus agendi* is the same whether opium be administered internally, or applied externally, I ventured to propose a plan of treatment, which seemed less objectionable than those in common use, and

* A powerful motive for discontinuing the attempts to cure by internal means.

† This observation was suggested to me by Dr. Percival.

more conformable to some of the leading circumstances of the diseases.

That the task I undertook to perform was very imperfectly executed is sufficiently evident; it is therefore not surprizing, that my endeavours to demonstrate the absurdity, and even cruelty, of persisting in that hackneyed routine of practice in hydrophobia, which experience has fully shown to be only calculated to harass and distress the patient, and to disappoint and disgrace the medical practitioner; have not been attended with all the success I could have wished.

I conceive however, that much has been done in the interval which has elapsed, towards preparing the way for trying the effects of the opiate friction in hydrophobia, by the unequivocal and satisfactory demonstrations which have been given of the anodyne and antispasmodic properties of opium when applied externally, in the course of the lymphatics, by means of long continued friction. Various cases have been recorded where it was thus introduced, and was found to exert its salutary virtues, so as to produce the most beneficial consequences, (and without occasioning those inconveniences which often arise from its internal use, especially in large doses,) after the same medicine, both alone, and joined with other antispasmodics, tonics, &c., had been exhibited internally with little or no benefit, or had been rejected altogether: and though

the *modus operandi* of opium applied externally has not been completely ascertained, we shall hardly be inclined to reject *the important facts* we are now acquainted with, merely on that account. *

Hitherto, my attempts to ascertain the primary operation of opium applied externally on the pulse, have not been successful. Patients afflicted with spasmodic or convulsive diseases being usually timid and apprehensive, are not favourable subjects for the purpose; but I have reason to believe, that opium acts more simply and directly as a sedative upon the vascular and nervous systems when applied externally, than when given internally; and I think it is principally, if not entirely to this cause, that the superior advantages of applying it externally, in certain cases, are to be attributed.

Several passages occur in the places just referred to, which strongly corroborate this idea. In the case of Mr. G. P. (see No. I.) calmness was the first effect of the O. F. which was succeeded by sleep, *a return of appetite*; and the first time his pulse was examined, it was found reduced from 100 to 80: and in that of Mrs. ———, “ I found her (says Dr. P.) in a state of high delirium without fever. Having remarked that under similar circum-

[* A few alterations have been made in the remaining part of this paper.]

stances, the internal exhibition of laudanum aggravated the affection of her head, probably by producing inebriation, I regarded this as a peculiarly favourable opportunity of trying the use of opium *externally*. I therefore directed &c. In a few hours she was observed to become considerably calmer. The like inunction was repeated at night." The day following, "I found her perfectly composed and rational. She had enjoyed much refreshing sleep. Her pulse was regular, her heat natural, and a gentle perspiration had taken place soon after the first inunction."

In the case of Mr. ———, (Dr. P's. second patient) its sedative operation appears still more evidently; and in that of John Jackson, (see No. II.) its directly sedative effects upon the vascular and nervous systems are strikingly exemplified; as will appear from the following extracts. "June 12. He found means in the night to extricate himself from the strait waistcoat, and has been so noisy the two last nights, as to disturb the patients in the neighbouring wards: *he never ceases talking; his eyes are blood shot; a constant tremulous motion prevails in every part of his frame: pulse 120.* June 13. *He slept well (after the use of the O. F.) the whole of the last night; the tremor is gone, and he is easy, composed, and rational; pulse reduced from 120 to 88. He has no complaint except a slight mazziness in his head.* Two portions of li-

niment each containing half a dram of opium were applied."

A similar conclusion must also be drawn from the case communicated by Mr. Henry; (see No. III.) but this is a matter of trifling consideration, compared with the important *practical* consequences which are deducible from the case; a remark which is equally applicable, generally speaking, to the greater part, if not to all the rest.

A summary of this very interesting case, will, I presume, be acceptable; and will be the best commentary I can offer.

On the evening of July 28. Mr. H. visited the patient and found her in a state of great irritability, *with a rapid pulse, considerable heat, and fallen countenance.* "She now," says Mr. H. "with a degree of obstinacy I have seldom witnessed, protested against taking any medicine, or even any appropriate food. On the 30th, a diarrhœa prevailing to an alarming degree, ten drops of laudanum, concealed in a cup of coffee, were given without her knowledge; and this single dose was the only medicine which, during three days, we were able to administer. She was sinking fast, *her pulse very rapid and feeble*, and she had a tendency to delirium. Wine, which in this state, seemed highly requisite, she positively rejected, and I despaired of being able to succeed by internal means. I therefore resolved to try the external

application of opium. The following ointment was directed, &c. This application seemed to have some sedative effect, and was therefore repeated in the evening. The next morning, August 1st, I had the satisfaction to find that she had had some comfortable sleep; but the looseness recurring, we contrived to convey ten drops of laudanum again in coffee. The ointment, with an increase of ten grains of opium was continued, and as she appeared more composed, I determined to abide steadily by it. *The good effects were each time more evident; sleep almost constantly followed the application of the ointment, though no more laudanum was given internally; her pulse and the intensity of heat were gradually reduced, the diarrhœa was stopped, and on the fourth day from the commencement of this treatment she began to take some wine, acidulated with sulphuric acid. The friction on different parts was persisted in till the 8th. of August inclusively; when the urine having, for the two last days, deposited a proper sediment, and every symptom of fever having disappeared, it was discontinued.*"

The two next cases (see No. IV. and V.) afford striking examples of the efficacy of this remedy in GANGRENE, *under circumstances the most unpromising.*

In the former of these, (the case of Esther Knowles) it was not prescribed *till after the failure of opium internally both in the solid and*

liquid form, with as much bark and wine as the patient's stomach would bear, which she took a week without much abatement of the pain ; the ulcer still spreading ; her stomach rejecting every thing she took, and the debility so great, that if she raised her head from the pillow, she fainted.

In this stage of the disorder, recourse was had to the frictio opiata. “ The next morning”, says the report, “ she was easier, and the ulcer did not appear to have spread.” (Mr. Barlow had before said, the ulcer had a gangrenous appearance; that the pain was excessive, and, as she expressed herself, shot from her thumb to her heart.) “ The frictions were continued *five days* longer, with an ounce of the tincture of opium each day, during which time the pain left her, and the ulcer looked better every day;” &c.

Here it is of consequence to remark, that the ulceration was spreading when the opiate friction was first applied, and that its progress was *immediately* arrested. Indeed it would seem, from the immediate and decisive effects it produced in the case which has just been noticed, and in that which we are next to notice, and from the additional testimony contained in No. X; to be endued, in no inconsiderable degree, with the property of arresting the progress of Gangrene, and of restoring the languid powers of life when nearly exhausted. Such appears at least, to be the necessary inference from

the evidence, as it stands at present; particularly that part of it which is comprised in the other case, (see No. V.) which I shall beg leave briefly to recapitulate.

J. B. was received into the hospital on account of a considerable sphacelation in the groin, from a bubo which had been opened some time. It was then (at the time of his admission) rapidly increasing; and from the general state of his health, there was every reason to fear a fatal termination. The part was ordered to be fomented, and the carrot poultice applied; *he had cordials, with bark and opium prescribed, and as much wine as he could take; but notwithstanding, the sphacelation still continued to advance.*

Oct. 12. This morning he was extremely ill; the attendants thought he would have died in the night. His stomach rejected every thing he took; *his pulse could scarcely be counted; a diarrhœa had come on, and his groin presented a most shocking appearance.* “*I concluded (says Mr. Docker,) a few hours would have terminated his existence.* It now occurred to me, that opium, *introduced by friction,* would probably be attended with advantage, and I determined to try it *as the last resource.* I accordingly directed Tinct. Opii, Ol. Oliv. a 3ij Camph. 3ss Vitel, Ovi. q. s. M. to be immediately rubbed into the thighs and legs.

“I visited him a short time afterwards” continues Mr. D. “and found him, I thought, *more*

composed and less languid, and he had taken some wine without sickness. I directed the same quantity to be used again, and to be repeated in the course of the night, with the addition of one dram of Tinct. Opii. October 13. This morning evidently better; had passed the night with some sleep, and the inflammation about the edges of the ulcer considerably abated; the diarrhæa had also stopped. I directed three drams of Tinct. Opii to be used three times in the course of the day. I saw him in the evening; he had taken a good deal of wine, and some soup, without any sickness, and his pulse was better; (from which I conclude, that whatever other alteration was observable in the pulse, its frequency was diminished.) Four drams of Tinct. Opii were ordered to be used during the night. 14th. This morning he appeared in a progressive state of recovery, though he had slept but little and perspired profusely; but he had had a regular stool, and the inflammation about the edges of the ulcer had stopped, and its surface looked less gangrenous. I directed four drams to be rubbed in every five hours. 15th. A good deal of composed sleep during the night; the inflammation and spreading entirely stopped; the slough separated from the sound parts, and the ulcer now looked quite clean, &c."

More satisfactory proofs of the directly sedative effects of the opiate friction, in diminishing that *morbid irritability*, and the diseased

actions consequent thereon which occur in gangrene, could scarcely be wished.* But the facts speak so plainly for themselves, that no commentary is necessary. I shall therefore content myself with observing, that a remedy capable of producing these effects, has long been a *desideratum* in medicine; and I have great hopes, that the frictio opiata, will, in a great measure, supply this defect; attention being given to the employment of such other means, as may tend to promote the object in view. Should a specific be hereafter discovered for gangrene, is it reasonable to expect it will produce more favourable, or more decisive effects, than those which were exhibited in the instances here adduced?

I should feel myself indebted to Mr. Docker, if he would have the goodness to reply to the following queries, through the medium of the Medical Journal. What quantity of camphire * and oil did each portion

[* Nor is Gangrene the only disease in which it has manifested the power of diminishing morbid irritability and its consequences, in a manner equally extraordinary; see the case of Mr. G. P. No. I; John Jackson, No. II: No. III; No. VI to XVI, &c.]

* I have lately employed camphire along with opium, externally, in a case of typhus fever, with a view to its sedative, antiseptic, and antispasmodic qualities. The effects were highly beneficial; but not more so than I have repeatedly seen take place from the employment of opium alone.

of the liniment contain? Have any syphilitic symptoms appeared since the bubo was healed? Has any mercury been employed?*

The case which stands next upon the list, (No. VI.) exhibits a pleasing instance of the success of this practice in *singultus symptomaticus*, after *internal* remedies had been tried without effect.

After premising some particulars which it will not be necessary to introduce here, Mr. Gapper tells us, on the 19th. the patient was seized with a hiccup, the most violent, distressing, and incessant he ever witnessed; it continued, without even ceasing a single minute, for near *eighty hours*, before any relief was obtained. The pulse during this period was small, and fluctuated from 120 to 130 in a minute. Mr. G. was not remiss in employing whatever remedies he judged most likely to be of service. Musk, asafoetida, amber, æther, volatiles, and *opium* were given, variously combined, at short intervals, and in considerable doses. A large blister was applied to the region of the stomach,

Camphire was also joined with the opium in some of the above cases; see No. I, II, and III; but with no particular advantage that I know of.

[* The replies to these questions are extremely satisfactory (see Mr. D's. second letter) and the more so as they are accompanied by some additional information concerning the use of this remedy in gangrene, tending to confirm the opinion I had formed, as expressed above, on this subject.]

and fomentations to the feet. At the end of the above mentioned period, not the least abatement could be perceived, the hiccup continuing as loud, as violent, and as incessant as ever. Mr. G. began now to despair of his patient; *when, as every thing else had failed*, it occurred to him to employ opium *by friction*.

“When I saw him the next morning,” continues Mr. G. “the opiate friction had been twice used, and I was much pleased to find with some effect. He was much more composed than on the preceding night; and though the hiccup was as frequent as ever, yet it was less violent and loud; the pulse was also reduced to 112. Encouraged by these flattering circumstances, I ordered a continuance of the liniment. On the morning of the 22d. he was in much the same state as on the preceding day; but in the evening, I was happy to find that *intermissions*, though short ones, had taken place. On the next day the intermissions were increased in frequency, and were extended to the length of half an hour or more, and the pulse was reduced to 90. The liniment was continued as before. *From this time the hiccup became less frequent and violent, and the intermissions longer, until the 25th. when it wholly left him.* The remainder of the case it is unnecessary to relate; it is sufficient to say, that my patient ultimately recovered.”

“ During the use of the opiate friction he took no other medicine than the simple saline draught; and so far from the bowels becoming constipated under its use, it was not even necessary to give him any aperient medicine during its exhibition. It occasioned a considerable degree of drowsiness, but not in any degree to excite the least alarm. The quantity of tinct. opii used was two ounces in the space of little more than three days.*; a quantity which could not have been exhibited in any other way without the most imminent hazard.

“ Such a wonderful effect as is here related, naturally leads the mind to speculate on the *modus operandi*, and to discover why a certain quantity of opium may be conveyed into the system through the absorbents, not only without detriment, but with great and decided advantage, which, if admitted into the stomach, would probably occasion death. I shall not enter into such a disquisition, as many and repeated experiments, and much reflection, are necessary to give a satisfactory explanation; I shall only be happy, if, in similar circumstances, it may prove as efficacious in other hands as it has done in mine. ”

Every friend to rational inquiry will join with Mr. G. in these humane and liberal senti-

[* More than this quantity was used in the same space of time in the case of John Bayley.]

ments; and I regret that a question of so much interest should have been so long overlooked. That I have not been wholly inattentive to the pledge I formerly gave, to proceed with the investigation, will appear by referring to the 7th. 8th. and 9th. vols. of the M. and P. J. in the pages mentioned in the introduction.

The question as it is here put, (without any reference to the *modus operandi*, which I must decline enlarging upon at present), may be solved thus.

When opium is introduced into the blood vessels by cutaneous absorption, it is very soon distributed by the heart and arteries, equally, or nearly so, to every part of the body, consequently its effects are less felt in any particular organ or set of vessels, (independently of its being applied *gradually, and in a more diluted state*, by being mixed with the chyle and lymph in its passage to the blood vessels) and without any cessation, either partial or general, of muscular motion, or secretion, taking place. These therefore continue to be performed, but with less rapidity than before, which not only gives vigour to the exhausted frame by allowing the wearied powers time to recruit, but at the same time tends, by diminishing the contractility*, to restore that equilibrium amongst the different

* See Cullen's Institutes of Medicine, p: 63, 4.

faculties and powers of the body, upon which health depends. Besides, such is the effect of this drug upon the part to which it is applied, that the absorbents would in all probability cease to act, long before a sufficient quantity could be absorbed to occasion death; and hence the necessity of changing the part where the O. F. is to be applied frequently, or for a long time together; as it must be in hydrophobia and tetanus, if any good be expected from it.

Very different, (almost diametrically opposite) will be the effects, if the same quantity of opium be taken *internally*; because, being applied in a more concentrated state, to the sensible and delicate membranes and vessels which compose the primæ viæ; in larger quantities at a time, (not *guttatim* as in the former case,) and not passing on successively as it is received, but being detained, in general, during many hours; and the functions of the stomach and intestines, (those of digestion, secretion, and nutrition,) being much more easily interrupted than the circulation of the blood in the heart and large arteries, a cessation of these functions (which are so necessary to the support of the animal œconomy) will take place, which will be either temporary or permanent, according to the dose which may have been taken &c.; chyle will cease to be formed, or if formed, the torpor of the lacteals will be such as to disqualify them for conveying it to the receptacle;

the vascular system will be weakened for want of the usual supply, by which means the torpor will become general, and will be succeeded by a train of symptoms, (in every respect the reverse of the former) among which may be ranked debility, languor, stupor, an insensibility to stimulants of every kind &c.; as is explained in volume 7, page 497—506; and in vol. 8, page 325—330.

But to return; this case applies with peculiar force in support of the idea I entertain of the action of opium, mentioned above. There is no ambiguity in the statement; every necessary information is given of the state of the patient, both before and after the use of the opiate friction. *

With regard to the efficacy of the plan in the above instance, there cannot, I imagine, be two opinions upon the subject.

The frequency and fatal tendency of the *symptomatic hiccough*, in fevers and other acute disorders, in this country, *and especially in warm climates, and in military stations*, are too well known, and generally admitted by authors, to require confirmation. The following passage

* I once saw a similar instance of singultus, and an additional one has since come to my knowledge. Every thing proved ineffectual, and the patients died. The former happened before I became acquainted with the powers of opium applied externally, or I should certainly have recommended it; the latter was not under my care.

from Pinckard's notes on the West Indies (vol. 3, p. 198) sufficiently demonstrates that it is at least equally frequent and fatal, in that quarter of the globe.

After describing the symptoms, progress, and termination, of the prevailing fever in the Islands he visited, he adds, "In others of the cases which prove fatal, we find hiccough the predominant and most distressing symptom: it continues in opposition to every remedy, and in a few days the patient is exhausted, and dies."

See also, the *Modern Practice of Physic*, by Robert Thomas, M. D., 2d. edit. page 358; where the general mortality of this symptom is thus confirmed.

"When hiccups arise at the close of any acute or malignant disease, or in consequence of a mortification, no advantage can be obtained from medicine, or any other means whatever."

To encourage hope under such circumstances may perhaps be thought to savour of enthusiasm; yet I should not despair of sometimes succeeding: at all events, the favourable report given of the O. F. in this instance, will most probably induce others to make trial of it, when it is hoped the result will be made public.

The case of Eliz. Hall (No. VII.) and of Betty Richards (No. VIII.) are highly curious and instructive. The former, (E. H.) was seized in the Autumn with bilious vomitings and diarrhœa, accompanied with pyrexia: proper medi-

cines were given, and in the course of a fortnight, she seemed mending for a few days, at the end of which time, the vomiting returned, with stitches in different parts of the chest, and considerable oppression at the præcordia, greatly interrupting respiration. Notwithstanding every attention the disorder increased, and she was now (at the end of five weeks from its commencement) so extremely reduced, that persons around her thought she was dying. *Nothing had stayed on her stomach for several days, either of food or medicine*; the vomiting was æruginous; *she had singultus often*; frequent loose motions of a dark colour; pulse feeble and quick; tongue florid, smooth, and shining; but was perfectly sensible.

“In this deplorable situation” says Mr. White, “I directed her stomach and belly to be fomented with a decoction of camomile flowers, and afterwards a liniment formed of half an ounce of tinct. opii, and the yolk of an egg, one half of which was rubbed on the abdomen at two o’clock p. m. and the remainder at bed time.

“What is very remarkable *she never was sick nor vomited after the first friction, but fell asleep immediately on the application of the opium, and slept for some time.* The fomentation and friction were continued a few days, gradually decreasing the quantity of opium; and as her stomach could bear it, a little wine was frequently given. It may be observed that not

only the vomiting ceased, *but the diarrhœa also; and she had no complaint afterwards except a slight pain of her legs. Her pulse was reduced to 96 on the third day, which before was exceedingly quick.* ”

“ She is recovering her strength very fast. ”

Betty Richards was admitted in a state of great debility, arising from the ravages which a caries of the hip, assisted by the misconduct of her master, had made in her constitution. She had been troubled with diarrhœa for several weeks; and a few days after her admission, a vomiting came on. Opiates, astringents, and aromatics were prescribed, and administered in conjunction with a proper and nutritious diet and wine, without checking either the vomiting or looseness; opium was likewise administered clyster-wise, in starch mucilage, by which the looseness, but not the vomiting, was restrained for a time, and for a time only.

Three drams of tincture of opium and one of linim. sapon. were now ordered to be rubbed into the shins, night and morning; *and all other medicines omitted. The first portion produced a good night, though she had scarcely slept at all for the last week; and the vomiting disappeared till towards morning, when the effects of the opium had ceased. The second portion and every other, for several days, had the same effect as the first; but*

it was now found necessary to increase each portion of the tincture to half an ounce. By this plan the vomiting and diarrhœa were, the one effectually prevented, and the other much lessened, while food, (which had, previously to its adoption, never remained with her for more than a few minutes) was both sought for and retained.

“ Her situation was such as to preclude all expectation of recovery ; but her life was certainly rendered more comfortable, and her existence prolonged several days.”

I shall conclude this article with a few remarks on a case of TETANUS, successfully treated by the opiate friction. John Mortice, (see No. VIII, Case 2,) was attacked with *trismus* and *opisthotonos*, in consequence of a large lacerated wound of the left leg, by which the tibia was laid bare to a considerable extent. The usual plans of treatment were adopted, but without effect. “ I was now induced” says Mr. B. “ from the success of some trials you had made with the opiate friction to try its effects in this case.

“ Half an ounce of laudanum combined with two drams of oil and the yolk of an egg, was therefore directed to be divided into two equal portions, one of which was rubbed into the thighs night and morning. No internal medicine was given under this plan, except two grains of opium at bed time. For some days the symptoms continued with very little change

or abatement; he kept his ground at least if he did not get much; the rigidity every where remained, and had extended to the injured leg. On the sixth or seventh day after the application of the liniment, he was evidently better; *had slept two or three hours in the night, which he had not done since his first attack; the jaws were strikingly more separated*, and I observed on moving him on his side to dress his leg, it was done with much less difficulty than before. From this period his recovery was gradual, and he went on so well from day to day, that I did not consider any thing necessary for him *except nourishments*; the application of the liniment was therefore discontinued, and his recovery trusted to the opium which he had regularly taken at bed time. *I had very soon reason to repent of the alteration I had made, for my patient not only made little progress after the frictions were laid aside, but actually appeared to be growing worse again; I was therefore obliged to give directions for them to be re-applied, which was done with manifest advantage, till every symptom of tetanus had completely vanished*".

A case of tetanus ending favourably is generally regarded as a fortunate event; but there were circumstances in the case of J. M. which rendered his recovery, in my mind at least, unusually so at that time: 1st. because the evidence is completely and decidedly favourable; 2ly. it was the first instance of this kind, in

which the idea I endeavoured to inculcate in No. I, (and still more strenuously in this and a succeeding number,) was acted upon; and 3dly. because it seemed probable, from the analogy which subsists between the two diseases, that the same method of treatment would prove equally efficacious in hydrophobia; a doctrine which I attempted to explain and recommend, at the same time with the former. *

From a single instance, however, no general conclusions can with propriety be drawn; otherwise, the above case of tetanus would seem to establish the superior utility of the opiate friction in that disease; but I would rather wait till farther experience shall enable us to speak with more certainty on a subject of so much moment. † It will be obvious that it cannot be expected to succeed in every instance, (perhaps in no instance) without the aid of such other means as the nature of the case, and the cause producing it, may require. ‡

Nov. 15, 1801.

* For an account of the effects of the O. F. in hydrophobia see No. XIV.

[† In the long interval which has elapsed the friction opiate has been often put to the test; in some instances with very good effects; and is now, I believe, generally considered as a useful auxiliary in the treatment of tetanus.]

‡ I have lately met with an instance of tetanus, in a girl of eighteen, brought on by a violent blow on the hypogastric region. The inflammatory symptoms ran so high, as to require

NO. X.

*From the Medical and Physical Journal. Vol. 7,
p. 258.*

.....

*Mr. Docker's second Letter, containing the sequel
of the Case of John Bayley.**

TO THE EDITORS.

“ Gentlemen,

“ ACCIDENT prevented my seeing the 34th. Number of the Medical and Physical Journal till within these few days, or I should certainly have answered the queries of Mr. Ward, respecting the case of John Bayley, inserted in your Journal for February, 1800, in which I had successfully used the opiate friction.

the repeated application of leeches, blisters, antiphlogistic purgatives, fomentations, the warm bath, &c. Opium was also employed, both internally and externally. The accident happened seven weeks ago. When I saw her last, there was a considerable fulness and tension of the abdomen, and it appeared to me, that matter was forming within the cavity; the spasms had nearly subsided for a few days, but at that time they came on more frequently. The opium internally, was, I think, hurtful; how far the *external* application was useful, I am unable to say, but do not entertain a doubt of its having contributed very materially, towards her recovery.

* See No. V.

“ I am happy that Mr. Ward’s questions give me now an opportunity of correcting an error of the press with respect to the quantity of camphire and oil which was used in each portion of the liniment in the case of Bayley. The following was the quantity used at each friction, viz. camphire half a dram, ol. oliv. two drams, the tincture of opium *only* was increased or diminished as circumstances indicated.

“ In answer to the other questions of Mr. Ward, whether any syphilitic symptoms have appeared since the bubo was healed? and whether mercury had been employed? I can only inform him, that during the period he continued in the hospital after his recovery, no venereal symptoms whatever appeared; but he had taken mercury to a considerable extent previous to his admission into the hospital, but as it was exhibited during the time that he was in Holland, and partly on board a transport, where it was impossible proper attention could be paid to him, I attributed the bad state of his health and the sphacelating appearance of the bubo principally to that circumstance.

“ *From being much emaciated, he became in a very short time after his recovery, extremely corpulent, and left the hospital to join his regiment in the best possible state of health. I have since that heard no more account of him.*

“ The opiate friction was used in a few similar cases with that of Bayley, but not with

the same *striking* advantages, yet was of evident service in arresting the spreading of gangrene, and allaying irritation. Lately I have had no opportunity of trying its efficacy further, but am convinced of its good and powerful effects.

“ I sincerely wish Mr. Ward every success in his indefatigable endeavours to ascertain the *modus operandi* of opium when introduced by friction, and he may depend upon my communicating the result of any future trials I may have an opportunity of making with it.

I am, &c.

THOMAS DOCKER.”

“ *Dover, Feb. 7, 1802.*”

NO. XI.

*From the Medical and Physical Journal. Vol. 7.
p. 305.*

.....

TO THE EDITORS.

“ Gentlemen,

“ IF the enclosed be deemed worthy of insertion in your very valuable Journal, I beg leave to offer it for the same.

Yours, &c.

W. WARNER,

Member of the Royal College of
Surgeons.”

“ *Victualling Office Square, Tower Hill,*
March 1802.

“ Much has been said in your esteemed Journal on the beneficial effects derived from the external application of opium in several complaints of the human body; and its use has been strikingly beneficial in relieving patients from the exerceiating pain of excessive cramp in the bowels and lower extremities, attendant on an alarming disease, (when neglected by patients, and suffered to continue without calling in medical assistance) viz. cholera morbus; and when opium has been ejected immediately on being taken into the stomach, as I have several times witnessed.

“ Of all the periods of life, none seem to demand our particuilar attention to relieve the many afflictions thereof so much as that of childhood. Enough cannot be said in praise of the discovery made of the cow-pox, when we consider the dreadful malady, with all its fatal symptoms, which most frequently attack the above period, and which will be now thoroughly overcome.

“ Another disease most incident to the aforementioned period, and very distressing to the sufferer as well as tedious in its duration, by which very many are destroyed, is the disease termed Hooping Cough.

“ Having been the subject of this disease at an adult age, my thoughts were often engaged with a strong desire to relieve (I will not say

cure) in future cases speedily. Nothing seemed so likely as the use of opium; but it being dangerous to be put into the hands of patients, and opportunity not offering for its use, it being a common received opinion that no remedy will succeed but change of air, I almost relinquished the idea, till hearing that four patients, whom I knew had it severely, were relieved by the use of opium alone. (It was recommended by a person not of the profession.)

“An opportunity now offering in my own family, an adult subject, at my request he made use of the remedy; at the same time it was applied to a patient between two and three years of age. Both subjects being very different in all circumstances, I will take the liberty of relating both cases.

“S. B. twenty-one years of age, a healthy constitution and sanguine temperament, was attacked with cough, supposed from taking cold, which increased in violence about three weeks, during which time a variety of balsamic medicines, with anodynes, were taken, but to no good effect. Soon, from its violence, it became alarming; the fits of coughing were attended with hæmorrhage from the nose, and terminated either with vomiting, or a state almost amounting to suffocation; which left no doubt of its being whooping cough: a violent soreness of the abdominal muscles was occasioned by

its urgency; and debility, to a great degree, was experienced.

“ Fourteen ounces of blood were drawn from the arm, which shewed no signs of inflammatory affection, but in every respect in a healthy state. Liquid laudanum was rubbed all over the abdomen and pit of the stomach, twice a day, (without taking any medicine) which gave him great relief; the cough abated in frequency and violence; vomiting and hæmorrhage both ceased. This was continued for about a fortnight, when the cough almost totally subsided, and his usual state of health returned.

“ The next case was a subject very unpromising for so violent a disease, and in whom opium was also serviceable.

“ I. P. between two and three years of age, a weakly habit, much inclined to rickets and scrofula, was attacked with hooping cough; and when I first saw him, very unfavourable symptoms were present; the cough almost incessant, breathing very difficult, countenance swollen and rather livid, very feverish, *and refusal of all food*; no sleep, but comatose. The laudanum was used as in the former case; and, in addition, small doses of the decoction of the yellow bark were given three times a day, and the bowels now and then relieved by a gentle purgative. Good effects were visible; *in a few days the above symptoms went off, and the appetite returned.*

The bark was left off, and the laudanum used for about a fortnight longer, when the child was recovered.

“ Another, in the same family, only eight months old, is now under the use of the same remedy, with only a laxative now and then, and is recovering.*

“ Dr. Cullen in his excellent work, (vol. 3,) speaking of this disease says, “ When the contagion is recent and continues to act, we neither know how to correct or how to expel it; and therefore the disease necessarily continues for some time; but it is probable that the contagion in this, as in other instances, ceases at length to act; and that then the disease continues, as in other convulsive affections, by the power of habit alone.”

“ After directing various means, according to different stages of the complaint, he mentions the several antispasmodies; he relies most on opium, but there I presume is meant the internal use; whereas, we know the uncertainty of the dose, as well as the inconvenient effects produced by it in children as well as in adults. On the other hand, its external use promises the greatest benefit.

“ Many remedies are used for this disease, but the one most used, is an outward application, called Roche's Embrocation, which, in three

* “ Nine or ten cases have succeeded with using this remedy.”

instances, ill effects appeared to arise from the cough suddenly stopping after the use of it; two died in strong convulsions, the third was relieved from approaching suffocation by a smart purge and an emetic, and is now living.

“The laudanum moderates each paroxysm in frequency, &c. therefore, if early used, prevents the expectoration which is otherwise caused, and though the cough goes on some time, it evidently shortens the usual paroxysm. In order to disguise the laudanum, a few drops of æther may be added, and in this way used as an embrocation twice or thrice a day, over the stomach and belly.

“A flannel waistcoat should be worn by the patient, as, no doubt, it promotes absorption, and prevents the vicissitudes of the climate taking that effect on the skin, which we know it does, and acts as an exciting cause of coughing.

“Perhaps I am premature in offering this to the public notice, but the disease being so very prevalent at present, and the consequences so generally fatal, I thought it might excite others in the profession to make trial of the same remedy; and if with the same success, I hope it will plead a sufficient apology.”

NO. XII.

*From the Medical and Physical Journal. Vol. 8.
p. 16.*

.....

Mr. White's second Communication.

TO THE EDITORS.

“ Gentlemen,

“ I HAVE thought proper to send the subjoined case, as another instance of the efficacy of opiate friction, corroborative of Mr. Ward's statements, although the case occurred long before his remarks were published.

I am, &c.

W. WHITE.

Bath, June 11, 1802.

“ John Bulmer, aged 54, a servant of Col. G——, was visited by Mr. Creaser, surgeon, of this city, in April, 1800, on account of a severe strain in the ankle joint. On the second day after the accident a delirium succeeded, which rendered his admission into the Infirmary necessary. When I saw him, he complained of a pain in his left side, attended with a troublesome cough. His pulse was 106, and the stroke hard; his tongue was clean, and his bowels open. The ankle was somewhat swelled and

discoloured, but he did not complain of any pain in that part. Although he gave a tolerably clear account of himself, yet there appeared at the same time a considerable degree of wildness about him, and incoherency of speech; his eyes were much suffused, and the pupil contracted. The antiphlogistic plan was adopted, and the blood taken from his arm put on an inflamed appearance. The delirium, however, increased to a such a degree that it became absolutely necessary to confine him. He was cupped; the temporal artery was opened; blisters were successively applied to the back, and inside of the legs, and sinapisms to his feet. Opiates were given him, and also digitalis pretty freely. Notwithstanding all these means were made use of, he remained without any sleep for five days, still continuing highly delirious, *at last refusing every thing that was offered him, whether of food or medicine.* In this deplorable situation it was determined to try the effects of opiate friction. One scruple of opium was dissolved in half an ounce of spiritus ætheris vitriolici comp. half of which I rubbed on the inside of his thigh, at ten o'clock p. m. and directed the remainder to be used in the same manner, at two o'clock, a. m. The next morning there appeared no alteration whatever; but at two o'clock in the afternoon he was seized with a violent convulsive fit, which terminated in a profound sleep of twelve hours' continuance;

when he awoke perfectly sensible. For two or three days *he scarcely awoke but to take his food*; but there was no return of delirium, and in a short time he perfectly recovered."

NO. XIII.

*From the Medical and Physical Journal. Vol. 10,
p. 345.*

.....

" *To Mr. Ward, Surgeon, Manchester.*

" SIR,

" AS you have expressed to me a wish with which others perhaps may sympathize, to be acquainted more particularly with an instance of trismus alluded to in one of my periodical reports of diseases in the Monthly Magazine, I have thought it right to communicate to the Editors of the Medical Journal; and in case of their permission, to the public, a brief abstract of the case, as it was taken down during my attendance upon the patient.

I am, &c., J. REID."

Southampton Row, July 16, 1803.

" TRISMUS TRAUMATICA.

" April 27, 1803. Landeman Jues, æt. 24, a marine, has left the service nearly a twelve-

month, having received a severe wound on his leg, which within the last fortnight has given him very great pain and uneasiness. A few days ago he was attacked with the usual symptoms of a cold, and slight fever, which confined him to bed; a day or two after which he was seized with a violent pain and stiffness of the jaw, especially severe on the left side, which has since greatly increased, and at present, (the seventh day after the attack of the disease) his jaw is locked, but not so completely as to prevent broths and other fluids from being poured into his mouth, and he has no difficulty of swallowing. He likewise complains of pain along the spine, and that sometimes he is drawn backward by a sudden spasm; he is likewise afflicted with pain of his left arm, and of that side of the neck, with slight spasmodic twitches, pulse quick, small, but very regular; skin natural; body very costive; some thirst, pain of the head and belly; his jaw and neck have been rubbed with lin. vol.

“ R. Opii puri, unc. unam axung. q. s. ut fiat unguentum. Divide in partes vj. Let his jaw be rubbed with one of these portions for a quarter of an hour. Let this be done six times in the course of the day.

“ Habt. Pulv. Jallapii Gr. xxv. Let him have broths and beer.

“ April 29. The pains of his back and the spasmodic contractions have somewhat abated;

and the jaw is not so fast locked. The opium was well rubbed in, but produced no inclination to sleep. * Body costive.

“ Rep. frictio opiata. Hab. Pil. Opii ij bis in die.

“ May 2. The medicines ordered to be repeated with the addition of the electuarium purgans, and if that should not operate, the administration of a clyster.

“ May 4. Trismus as before, severe pain of bowels, with extreme costiveness. The clyster had very little effect; the electuary none at all. Good sleep since he took the pills; pulse small and quick; no difficulty in swallowing. Rep. frictio opiata. Habt. mist. cathart. coch. mag. ij. tertia quaque hora.

“ May 5. Spasm of jaw somewhat relaxed; still he complains of great rigidity of his limbs and back: took 3 oz. of mist. cathart; had a copious stool this morning and another at noon; slept well last night. He began to take the bark to day. Contin.

“ Trismus gradually abating, his limbs are not so stiff; pain of neck and back relieved, body open; he can sit up for some hours together: good sleep. Contin.

[* One reason might be, the o. f. having been applied to the part affected, instead of to a distant part; as the legs, thighs, abdomen, or arms, where its effects upon the system would have been much more powerful.]

“ May 8. Jaw cannot yet be completely opened, but he recovers strength and appetite; pains relieved; stiffness of limbs abating; let him have wine and broths.

“ Rep. M. Cinchon. and frictio opiata.

“ May 9. Trismus as before; recovers strength; complains of pain in his thigh. Contin. Med. Cinchon. and frictio opiata. · Frict. femur lin. volat.

“ May 13. Trismus gone: still a slight stiffness of jaws and of his knees. Om. frictio opiata. Contin. Lin. Vol. et Mist. Peruv.

“ May 16. Stiffness of jaws gone; knees still troublesome; continues to recover strength. Rep.

“ May 19. Decidedly convalescent; let him continue the wine. Rep. Mist. Peruv.

“ May 23. Cured.

“ During the process of convalescence, in addition to the bark, steel was prescribed according to the following formula.

“ R. Ferri ppt. Gr. v. Gum Myrrh. Gr. x Mucil. G. Arab. q. s. fiat mass. divid. in pil. iij. Capt. æger pil. j ter in die.”

INTRODUCTORY REMARKS TO NO. XIV.

(Not before published.)

.....

THE substance of the following outlines on hydrophobia and tetanus, was published upwards of five years ago in the 11th. volume of the Medical and Physical Journal.

I then announced my intention of publishing at my leisure, a detail of the method I had pursued in prosecuting my inquiries, and the data on which my conclusions were founded. Various causes however, which it would be needless to enumerate, and which still continue in force, have prevented me from compleating it in the manner I wish; I have therefore determined to republish my former sketch, with such alterations and additions as seemed necessary: choosing rather to incur the risk of being censured for temerity, than to withhold from the notice of the public, a scheme of practice, which appears to me more likely to be attended with success, than any that has been hitherto proposed.

I had once resolved to have printed only a few copies for private circulation; but this would have defeated the principal end I had in view; that of making my opinions on some important and controverted points, generally

known, in order that their merits or defects might be more speedily appreciated.

I am conscious the following production will be found very defective, and that some faults might have been corrected, had I submitted it to the perusal of my medical friends; but this would have required time, and no one possessing the least spark of ambition would choose to be anticipated in a scheme, to the completion of which, even in its present imperfect form, he had devoted a good deal of time, and which he conceived was calculated to prove beneficial to the community. And whatever its demerits might be, I had no wish to exonerate myself at the expence of others. But it would show a want of that deference which is due to the public, not to declare, that no exertions were spared which it was in my power to bestow, to render it deserving of attention. Nor were these the only reasons I had to urge: many persons having applied at the Infirmary about that time, (in the winter and spring of 1803-4,) who had been bitten by mad dogs; and besides, tetanic complaints being most prevalent *during a state of warfare*, and in the summer season, was a strong argument in favour of immediate publication.

But what may probably be thought still more objectionable, is, the plan I adopted, of publishing a chain of inferences, without ac-

companying them with the arguments and facts, from which those inferences are drawn.

All I have to say on this head is, that this mode of proceeding appeared more eligible upon the whole, than any other; and it had this advantage, that it enabled me to include the outlines of the doctrine relating to the nature, causes, and cure of tetanus as well as hydrophobia, in one and the same scheme; the analogy subsisting between the two diseases being sufficiently strong, to justify this method of proceeding. A sufficient number of facts and explanations will also be found interspersed, and such references made to the works of different authors, as may convince the reader, that however novel some of my opinions may be, they are not supported by reasoning and analogy *only*, but by facts also: or they may rather, I think, be considered as legitimate deductions from facts which are familiar to every one, and therefore stand upon much higher ground than mere hypothesis.

Nor are these the only arguments that may be urged in its defence; for such is the nature of the doctrines I had occasion to advance, and of the diseases to which they apply, that the value of the former could only be ascertained, by putting them to the test *in cases of actual disease*: and though I had seen three cases of hydrophobia, and about twice that number of tetanus, yet they all occurred before

I had made up my mind on the subject, and a long time I thought might elapse, before a case of either might occur to me again. And though the method of treatment I proposed did not come forward under the most favourable auspices, not having obtained the sanction of experience, yet that circumstance alone did not appear sufficient to prevent it from being tried, unless some other were substituted, which should have stronger claims to attention: for as every method which has been as yet resorted to in hydrophobia has been unsuccessful, new ones must of course be instituted; for I cannot suppose there will be many advocates for continuing the old, (and what appears to me absurd) routine of practice, after all hope of its proving successful shall have been abandoned.

But there is one class of readers whom I almost despair of being able to conciliate: I mean those who protest against all theory, as being either unnecessary or useless. To such the following remarks may with great propriety be addressed.

“ To make [“]experiments is, I own, the only way to promote natural knowledge; but to treasure up every unsuccessful enquiry into nature, or to communicate every experiment *without conclusion*, is not to promote science, but to oppress it.” Goldsmith’s present State of polite Learning. Chapter 5.

“ As experience without theory will never make a physician, any more than any other art can be acquired, without an acquaintance with the rules on which it is founded; and as he that is guided merely by appearances, without being able to reason about their minutest differences, *will never see an error till it is past recovery*; it will be found by those who impartially examine this question, that true satisfaction is no more to be found in mere experience, than in mere hypothesis. If there be any thing of science in medicine, it is conducted by demonstration, because conversant with objects cognizable only by the evidence of sense; but without this, it is chance and confusion, and the enthusiast and empiric are upon an equal footing. Not that we can pretend to certainty in all instances of practice, because there are more data required for that, than the nature of things can admit of; but the theorist will come at more of those data than any other, and in every step he takes will be able to compute all the chances that are risked on either side of a disputable case; whereas the empiric and experimenter are altogether in uncertainty, *having no rules to make even observation itself of real use.*” Pref. to the Ed. Pract. of Phys.

Again, “ There are some modern practitioners who declaim against medical theory in general, *not considering that to think is to theorize; and that no one can direct a method*

of cure to a person labouring under disease without thinking, that is, without theorizing; and happy therefore is the patient whose physician possesses the best theory." Pref. to Zoonomia.

It may also be worth their while to consider, that the mere matter of fact system has been acted upon in the treatment of hydrophobia, *from time immemorial, without having mitigated the sufferings, much less preserved the life, of a single individual.* Not that I am an enemy to facts; on the contrary, I consider theory as no farther valuable, than as it can be shewn to be agreeable to the former, to which I shall often have occasion to refer; nor do I wish my own theory to be countenanced any farther than it shall appear to be supported by facts.

But what will probably have more weight in obviating every kind of objection, than any arguments of my own, will be, the proofs I shall be able to bring, that a scheme of this nature, has been not merely sanctioned, but strongly recommended from very respectable authority.

"After the symptoms of hydrophobia have appeared," says Dr. Hunter, "*no medicine or remedy that has hitherto been used has relieved, much less cured the disease.* On this consideration it may seem unnecessary to enumerate the various things that have been tried; but without a knowledge of what has been attempted, much time must be lost in useless trials, and fruitless

repetitions ; and in fact, *the want of preconcerted order and method in investigating the cure of this disease, is very apparent in all the writers upon the subject, and is probably a principal cause, that no progress has been made in that important inquiry.*

“ In order, therefore, to avoid a repetition of medicines, which can be productive of no good, *we ought to have preconcerted various new methods of treating the disease, which may be tried as circumstances may indicate.* In most diseases the doctrine of the *juvantia* and *lædencia*, as it has been called, affords some direction respecting the treatment ; in hydrophobia there is scarcely any thing observed to afford even a temporary relief.” *

Since, (as well as before) the publication of the observations just quoted, numerous attempts have been made, (much to the credit of the authors,) to supply the deficiencies complained of, but none of them, I believe, at all calculated to answer the ends proposed. The juncture therefore seemed favourable for examining the grounds of those measures which have been attended with such fatal consequences, and whether our want of success be owing to the incurable nature of the disease itself, *or to the imperfection of our art, which prevents us from availing ourselves of the proper remedies,*

though placed within our reach, the latter of which I take to be the real cause of the failure.

But be this as it may, it is certain that very little progress has been hitherto made, either in the pathology or treatment of these diseases; so that I may venture to assert, that there is not a single well authenticated instance upon record, of a cure having been effected in hydrophobia.*

* “I have long thought our mode of treating the hydrophobia wrong,” says Dr. Sims, “*beyond a doubt it is completely unsuccessful.*” *Memoirs of the Med. Soc. of Lon.* V. 2. p. 1.

“I should be exceedingly happy” says Dr. Maclean, “were I justified in encouraging the belief, that they” (two cases of hydrophobia which he had met with) “furnished any thing tending to throw light either on the pathology or cure of this *most formidable of all human maladies.* I fear however they serve only to afford still farther evidence, *of the futility of our art in combating its destructive ravages.*” *Ham. on Hydrophobia.* V. 2. p. 293. See also Cullen’s *First Lines of the Practice of Physic.* MCCLXIX. MDXXV. —, MDXXVII.

I shall conclude the quotations on this subject with the following observations from the pen of Dr. Robertson, which have *recently* issued from the press.

“That the subject of the inquiry to which I then alluded is of the very greatest importance, none, I believe, will attempt to question; and extremely imperfect as the medical art in general is, there is certainly no department of it involved in such obscurity as the disease termed hydrophobia. In short, so ignorant are people in general of its real nature that I believe, had we made no pretensions to account for it

The difficulty, as well as the necessity of the undertaking, being thus established; I doubt not but the following attempt will be received with candour.

It is no common task, to explain in a clear and familiar manner, *a long list of phenomena*, which have confessedly eluded the researches of the most eminent philosophers and physicians, *of all ages and nations*; and to follow up this explanation with a plan of cure, apparently well adapted to many of the different cases and circumstances, of two of the most obscure and fatal diseases, incident to the human body.

In estimating the success with which the task has been performed, due allowance will of course be made, for the difficulties which ac-

at all, but merely been directed in our mode of attempting the relief of its symptoms, by an unprejudiced and close attention to the exact nature of such appearances as we imagine to indicate its existence, we certainly might have been much nearer the truth upon the subject, and could not have been farther from it, than we are at the present moment. Its almost paralyzing name, at all times strikes more terror in the public mind, than can arise from almost any other external evil. Death itself in a more natural way, is almost always borne with composure and resignation; but the fear of being doomed to the accumulated sufferings which we have been from the earliest period of our lives taught to believe as inseparable from that disease, unmans, and almost involuntarily, makes the firmest of us, during its supposed prevalence, shrink with terror at the appearance of the most puny of the canine race." See the M. and P. Journal. No. 124, for June 1809.

company the investigation, and which must be too obvious to require particular notice.

After so many ingenious competitors have entered the lists without accomplishing the object in view, immediate and complete success will scarcely be expected from the exertions of an individual. Under circumstances so peculiarly discouraging, it will be sufficient to shield my endeavours from severe or improper censure, should it appear that I have been fortunate enough to have discovered a path, which may *eventually* lead to success; or even to have furnished a few hints which may facilitate the progress, of some future, and more fortunate, inquirer.

It may perhaps be proper before I conclude, to advert to the apparent severity of the remarks which will be found in several instances to have been made. There are occasions however, where strong language is not only justifiable, but necessary; and if to persist in schemes of practice which are not merely useless, but pernicious, and which have been proved to be so in many hundreds of instances, and for many hundreds of years, be not of this description, I acknowledge my inability to discover what can, or ought to be considered, in that light.

NO. XIV.*

.....

OUTLINES

*Of an Attempt to investigate the NATURE, CAUSES,
AND METHOD OF CURE, OF HYDROPHOBIA
AND TETANUS.*



*From the London Medical and Physical Journal.
Vol. 11, p. 538.*

.....

TO THE EDITORS.

“NEARLY five years † have elapsed since I first ventured to call in question, the propriety of attempting to exhibit medicines *internally* in the treatment of hydrophobia and tetanus; and more than two (now upwards of seven) years, since I took the liberty, *a second time*, of

* This article was first printed in the summer of 1804.

† Now (July 1809) ten years.

entering my protest against this most injudicious practice,* (I had almost said, *this ingenious mode of tormenting*,) though so imperfect was my knowledge of the true nature of the diseases at that time, that I confess my objections were founded more on the horror expressed by this unfortunate class of patients (invariably in hydrophobia and very often in tetanus) at the sight of either liquids or medicine, and on the *uniform failure* of this method of treatment during a period of at least *two thousand years*, (*a length of time surely much more than sufficient to shew that the plan was altogether improper*) than on any correct ideas I could pretend to have formed respecting them; and the more I reflected on the subject, the stronger was my conviction of the necessity of *an entire change in our manner of proceeding*, before any progress could be made in the *methodus medendi*. Upon this ground it was that I recommended the external application of opium, and also because it seemed well calculated by its property of diminishing morbid irritability, to counteract the most dangerous and distressing symptom (the spasmodic affection of the muscles of deglutition) we have to encounter in these "*most dreadful of human disorders*". But the plan I proposed has not, to my knowledge, been tried in hydro-

* See No. I. and IX:

phobia ; * and only in five cases of tetanus that

* Opium was applied *externally* in a case of hydrophobia which was admitted into the Infirmary in August 1803 ; but cantharides and opium were given *internally* at the same time ; electricity was also employed. As usual, the case terminated fatally.

[The particulars have since been published by my friend Dr. Bardsley, in the 13th. vol. of the Journal, page 155 ; from which the following extracts, being connected with the subject of this paper, are quoted.

“ As the administration of opium, by friction, had produced a drowsiness, and *a suspension of his sufferings for a few minutes*, it was to be renewed twice during the time of the patient’s exposure to the effects of electricity. In half an hour from the period of the electrical machine being put in motion, he became more calm and tractable, and expressed a desire to drink some water, which he was able to perform with comparative ease and readiness, and with no small marks of pleasure, and even triumph. After the frictions had been completed, *he could lie down for ten minutes together, and did not start up in his usual hurried and distressed manner.*” Afterwards it is said, “The sparking now seemed to increase his agitation, and was therefore soon discontinued.” In his remarks the Dr. says, “Happy would it be for humanity, and highly honourable to the medical art, if a remedy could be discovered for this justly reputed *opprobrium* of medicine ! It is, however, somewhat consolatory to find, that opiate frictions, and the use of electricity, (in the manner already pointed out) seemed to possess the power of *abating the irritability of the system, and producing a transient mitigation of the patient’s sufferings.* Considering the very late period of the disease at which these remedies were tried, no very sanguine hopes could be entertained of their being useful, even as *palliative* means ; but may not more permanently beneficial effects be derived from their exhibi-

I have heard of,* in some of which it was evidently useful, though its effects were not so

bition in a very early state of the disorder? The administration of two such powerful medicines, as the pure caustic alkali and cantharides in substance, seems at least to be safe, if not useful, from what has been already stated. Most unquestionably, if it should ever fall to my lot to treat a third case of so distressing and fatal a malady, I shall be tempted to try safe, yet active doses of the arsenical solution* (as the most powerful tonic in the whole range of the materia medica) along with wine, opiate frictions, and electricity. I am the more confirmed in the hope of utility from this practice, as it met with the approbation and recommendation of my highly respected and much lamented friend, the late Dr. Percival. Sanctioned by his authority, medical practitioners may probably be induced to make trial of this method of cure:—a method that, in part, has certainly succeeded in alleviating some of the symptoms of hydrophobia; but which, indeed, is chiefly recommended by its supposed agreement with the rational principles of analogical induction.”

This report of the opiate friction under all the circumstances, and considering this is *the only case of hydrophobia* in which it has been tried, is as favourable as could well be expected.]

* Of five cases of tetanus in which the opiate friction was used, four were cured, but in all of them other means were employed at the same time, which renders it difficult to say precisely, what share of the merit was due to the former. Can it be shewn however, that an equal degree of success has attended the treatment of the same, or any given number of cases taken in succession, where internal remedies

[* The arsenical solution has been tried in hydrophobia by Mr. Dunlop of Rochdale, and also by Dr. Marcet, but without effect. Dr. M's case is related in the 1st. volume of the Medico-Chirurgical Transactions, just published.]

decisive as I expected; indeed, in one case only has it been fully tried, and in that it succeeded completely. * But long before this happened, my opinion had been, that our want of success in the cure of these maladies was more owing *to the want of a systematic arrangement of the phenomena*, and the judicious application of the knowledge to which such an arrangement would lead, than to any other cause; and these ideas took such firm hold of my mind as to have led me to reflect, frequently and earnestly, on the nature and causes of the morbid alterations observable in the diseases alluded to, and am inclined to hope some benefit may accrue to this department of medical science from my labours; indeed, I am greatly deceived if I have not found out a path which will, *if hydrophobia be remediable*, eventually lead to success. At any rate I have discovered (which is an acquisition of no small import, as it may probably lead the way to a plan of proceeding totally different to those in common use, the necessity of which I imagine will be obvious,) *why medicines administered internally never did,*

alone were employed? *And does it not hold out a strong inducement to relinquish the use of internal remedies in hydrophobia, at least until a rational theory of the disease shall have been formed, capable of directing us in the choice of more appropriate remedies than those in present use?*

* See the case of John Mortice, No. VIII.

and I believe I may venture to add, NOR EVER WILL, SUCCEED, *in subduing it.* *

I shall not at present enter into a detail of the method I have pursued in prosecuting my inquiries, or the data on which my conclusions are founded: these, with a few remarks on the pathology of diabetes, and some farther observations on opium, may probably be published at my leisure, should the reception of the following be such as to encourage me to proceed. †

The design of this paper is merely to announce to the medical world, through the medium of your Journal, *the result of my enquiries*, (as some time may probably elapse before the

* Undoubtedly, patients afflicted with *tetanus*, do, now and then, struggle through the disease, though treated in the common way; but so seldom as only to form an exception to a general rule.

[Though five years have elapsed since the above declaration was made, so far am I from having had reason to change my opinion with regard to the inefficacy of *internal* remedies, that farther reflection, and especially the many fatal cases of hydrophobia which have since been recorded, (more perhaps than ever happened before in the same space of time,) have only served to convince me still more, of its truth and consistency.] See the notes in the after part of this number.

† [It is here incumbent upon me to return thanks to the readers of the work in which my communications have appeared, for the indulgence and attention with which they have been received; particularly to those gentlemen who have entertained so favourable an opinion of them, as to have thought my ideas worthy of being adopted.]

whole will be ready for public inspection,) in doing which I shall purposely avoid entering into any reasoning on the subject, farther than is necessary to render what I have to say intelligible, and to enable your readers to reduce my ideas to practice, should they be inclined to think favourably of them.

All I beg is, that they will not hastily condemn a scheme of practice, which appears to me, better calculated than any hitherto proposed, to subdue the most terrific malady to which human nature is liable, and which has continued its ravages uncontrouled, *from the earliest accounts we have of it to the present time.*

Without farther preface I shall proceed to state the principal conclusions at which I have arrived.

I. Hydrophobia and Tetanus belong to the same nosological class and order.*

II. The remote causes are various, according as the diseases are idiopathic or symptomatic.

III. The predisposing cause of both these diseases consists in an unequal and irregular distribution of the nervous or sensorial power; the tendency to which is increased by external

* Dr. Cullen's classification appears to be correct, as far as it goes; but that of Dr. Darwin is preferable on some accounts: and what I particularly admire in it is, his having classed hydrophobia as a disease partly of irritation, partly of volition, and partly of association; which perfectly accords with my own ideas. But may it not, with equal reason, be considered as a disease of sensation?

heat, debility in the muscular and other coats of the stomach and intestines, and of the involuntary muscles generally, impure air &c. &c.

IV. The proximate cause consists in *an exuberance and retrograde action of the faculties of the sensorium affecting the voluntary muscles.* *

V. The proximate effect is the disease itself, which consists in *a spasmodic and retrograde motion of the fibres of the voluntary muscles.* †

* There are some who refuse their assent to the doctrine of a retrograde action of the vessels altogether, though it is a fact as well established as any in anatomy or medicine; (see Cullens Institutes of Med. p. 168 --- 172. 215 --- 16. Darwin's Zoon.) Others there are, who admit that it may take place in the muscular coats of the stomach and intestines, but deny the possibility of its occurrence in the absorbents, on account of the valves being so numerous and strong as to support a column of mercury when injected after death; which, they say, must necessarily, and at all times, prevent a regurgitation of their contents; not considering that the valves are composed of muscular fibres and vessels as well as the absorbents, and that when the action of the absorbents is inverted, the action of the valves must in all probability be inverted also.

[† “ Dread of water occasioned by the bite of a mad dog, is a violent inversion of the motions of the œsophagus on the contact *or even approach* of water or other fluids. *The pharynx seems to have acquired the sensibility of the larynx in this disease, and is as impatient to reject any fluid which gets into it.*” Zoon. Cl. 1. 3. 1. 11. --- Had Dr. Darwin written nothing but the above definition, and the sentence I am about to transcribe, these alone I conceive would have been sufficient to establish his fame as a physiologist and physician of first rate talents. “ All diseases originate in the exuberance, deficiency, or retrograde action, of the faculties of the sensorium, as their proximate cause; and consist in the disordered motions of the fibres of the body, as the proximate effect of

VI. *In violent tetanus every voluntary muscle in the body is affected as described in V.*

VII. *In hydrophobia, the spasmodic and retrograde motions (V.) are principally confined to the pharynx, the œsophagus, the larynx, the epiglottis, the tongue, and the muscles employed in deglutition; (the stomach, though an involuntary muscle, is often affected in the same manner), hence the characteristic symptom of the disease, horror at the approach of liquids or food; hence also the inefficacy and fatal consequences of administering medicines internally, and the cru-*

the exertions of those disordered faculties." (Pref. to the Classes.) --- Yet it is extraordinary, considering how accurately he has defined hydrophobia, that he did not immediately perceive the imminent hazard of attempting to cure it; and the improbability, amounting, in my mind, to *an utter impossibility*, of effecting a cure, by *internal* remedies; at least *during the continuance of the extreme sensibility of the pharynx and œsophagus*, which he has so justly described as being equal in degree, to that of the larynx and trachea: a circumstance which is quite sufficient, independent of the retrograde action with which it is evidently accompanied, to render medicines of every kind, *internally administered*, perfectly nugatory. But that this almost self evident proposition did really escape him, is very clear, from the methods of treatment he has recommended; all of which except mercurial friction, (which has been tried in numberless instances without the smallest advantage;) and mercurial fumigation, (which in my opinion does not merit a trial;) consist of medicines introduced by the mouth; and among the rest hydrargyrus muriatus dissolved in spirit of wine, which he directs to be given repeatedly, (See Cl. 2. 1. 5. 1.) and of the probable good effects of which he seems to have had a high opinion; I fear on very insufficient grounds.]

elty of urging the patient to swallow liquids, &c. There are also convulsive motions of the heart and arteries, evinced by the violent palpitations which often take place. At the same the voluntary muscles belonging to the chest and extremities are variously and violently agitated and convulsed, (the nervous power in them being abundant, and its action retrograde, but less so than in spasm; the energy of the brain seems also in some cases to be increased :) in some instances there is merely an increased action of the voluntary muscles; † in others the latter are affected, partially or generally, with spasmodic or retrograde action as in tetanus; all these circumstances contributing to produce that wonderful and horrible variety observable in this disease. ‡*

* To be convinced of the truth of this reasoning, we have only to turn our attention to *the relative situation* of the parts above mentioned, and to keep in mind *their natural action*, particularly that of the tongue and epiglottis, in the act of swallowing, and compare it with *the spasmodic and retrograde action* with which they are affected, and which render swallowing so difficult and dangerous in hydrophobia. We must also keep in mind the vicinity of the œsophagus and trachea, their similarity of form, the intimate connexion that subsists between them in the offices they perform, and how apt parts so circumstanced are to take on the same kind of action; the sphincter vesicæ et ani, for example.

† As in the case described by Dr. John Hunter, where the patient was relieved by running round Smithfield. See the Trans. of a Society. Vol. 1. Art. XVII.

[‡ If the delineation which is here given of the nature, causes, and phenomena, of hydrophobia, be in any tolerable

VIII. Of the other symptoms it will be sufficient to observe at present, that the prin-

degree correct, and I have taken great pains to render it so we need look no farther for a solution of the long agitated question respecting *the uniform failure* of the treatment it has undergone, and the consequent mortality of the disease. The reason is, (as I have long since observed, see above) "the plan which has been adopted, is altogether improper." It is not to any particular medicine that I object, but to medicines generally, *given by the mouth*. The fact is, we have had recourse to means, or, what amounts to the same thing, *to methods of administering those means*, which it is impossible in the nature of things should ever succeed, *on account of the sensibility, irritability, and mobility, of the pharynx and œsophagus, and the spasmodic and retrograde motions, with which they are, in 99 cases out of 100, affected*. Hence the necessity which I have long ago and repeatedly insisted upon, "Of an entire change in our manner of proceeding, before any progress can be made in the *methodus medendi*:" (see above)---and the propriety "Of avoiding every thing which can tend to agitate and alarm, excite uneasy sensations, or bring on a return of the spasms. In conformity to this intention, instead of importuning the unfortunate sufferer to swallow medicines, or liquids, of which he has so great a dread, clysters should be given every four or five hours to support the strength, consisting of good broth, milk &c. with from 30 to 40 drops of laudanum in each.* And however long the present *irritating* plans of treatment may be continued, *to these, and others of a corresponding nature, we must, sooner or later, resort*. This however will, in all probability, be a

[* By this plan, a lady, whose stomach was so irritable as to reject every thing she took, was supported, for several months, with little or no other sustenance; by which means her life was preserved. The case occurred seven years ago. She is still living. Were this mode of proceeding to be adopted in hydrophobia, larger portions of the anodyne would of course be required in the adult.]

cipal ones, such as the lassitude, *the shooting pains preceding the attack* of hydrophobia, *from*

work of time. Opinions of a contrary kind which have been so long in use, do not immediately lose their influence. Besides, to propose to relinquish the *internal* use of medicines, and to substitute *external* remedies in their stead; (*for it will be useless to compromise the matter by uniting the two plans, which seems to be the prevailing mode at present;*) and to call in question the propriety of the very common, but injudicious practice of inviting, *and even soliciting*, this pitiable class of patients to take medicines, drink water, &c. (which is infinitely more tantalizing and not more humane, than to propose a walk to a bed ridden paralytic;) or what is equally shocking to the feelings, of pouring water from one vessel to another in the same or an adjoining room, (when the *surprize* of the specators is always in proportion to the *horror* expressed by the patient,) are regulations so directly contrary to those which custom has established, that instead of being surprized at their not having produced all the effects I wish, the wonder is, all things considered, that they should have had any effect at all.

But what renders the prospect still more discouraging is, that a formidable list of *internal* and other *remedies* (as they are called) still remains untried, each of which it is to be feared, will be allowed its share of victims.

Among others which have been proposed (exclusive of a multiplicity of *nostrums* which still retain their influence,) are, wine, either alone, or mixed with some of the mineral acids, or vinegar; thieves vinegar; wine and vinegar injected per anum; capsicum and other aromatics; some of the concrete acids, such as the essential salt of tartar, of lemons, or the flores benzoes, joined with capsicum or other aromatics, formed into boluses with flour and water; ipecacuanha joined with acids and aromatics; tartarized antimony; co-

the part bitten upwards towards the head or heart, and never in a contrary direction, the great depression of spirits, restlessness, extreme sensibility to all impressions, the violent and long continued efforts to vomit ; the sense of suffocation, thirst, delirium ; the vehement and incessant exertions to get rid of the saliva, the variable state of the pulse and respiration, &c. &c., will be easily and fully explained on the principles laid down in III, IV, and V ; and those which are yet to be brought forward.

IX. The poison insinuated into a wound from the bite of a rabid animal, appears to

pious bleeding, joined with an antiphlogistic regimen and medicines ; nitrous and other mineral acids : olive oil in large quantities ; strong purgatives ; *cob-web* ; &c. &c. And, as if to show how far, in this particular instance, credulity may be carried, *bronchotomy* has been advised by Dr. Rush ! --- I am told too, that the experiment has been tried : need I add ? but without success.

Besides these, there are others, such as *cicuta*, *bella-donna*, and others of the narcotic tribe ; pure caustic alkali ; * the arsenical solution ; * *cantharides* internally, and externally in liniments ; the *mercurial* friction ; electricity ; * galvanism ; warm and cold *bathing*, &c., are strongly recommended as being deserving of a farther trial ; but which should, I think, be banished from practice in the treatment of hydrophobia, as being totally inadequate to the production of the effects expected from them, and therefore unworthy of the confidence which has been reposed in them.

[* If I have spoken doubtfully on the points to which this note refers : it is from respect to the opinion of those by whom they are recommended. My mind is and has been long, made up upon the subject.]

exert its influence *principally if not entirely upon the nervous system*; though the size, situation, and depth of the wound, and the violence used in inflicting it, causing the skin and muscles to be more or less lacerated, seem to have some effect both in producing the disease, and in determining the duration of the interval between the bite and the accession of the disease. A good deal may also depend on the nervous system of the patient being more or less irritable.

What is the precise state of the inoculated part in the interval between the healing of the wound and the coming on of the hydrophobia; and how the poison operates in producing those changes in it which immediately precede the disease, are points which have not been explained; but I hope to be excused if I say, I do not consider them altogether inexplicable.*

X. At the same time that certain parts of the system are affected as described in VI, VII, there is *a deficiency of the nervous or sensorial power in the involuntary muscles, which is in proportion to the exuberance in the voluntary*: hence the vital and natural functions are carried on in a weak and inefficient manner, from the sensibility, irritability, and mobility; or in one word, the *contractility* of the parts employed in

[* The consideration of these points is deferred to a more convenient opportunity.]

carrying on these functions, (namely the heart, arteries, muscular coats of the stomach and intestines) being greatly diminished. *And this is the reason why tetanic patients bear such enormous quantities of opium and wine, without experiencing the usual effects.* *

It also shews why opium *taken internally*, inasmuch as it tends to increase this *want of contractility* in the muscular fibres of the alimentary canal, both by rendering them incapable of receiving, and the nerves which supply them of transmitting, the necessary supply of nervous power, must be injurious; *by lessening action where it ought to be increased*, namely, in the stomach, intestines, heart, and arteries; *and increasing it where it ought to be diminished*, namely, in the *voluntary* muscles †

XI. Thus it appears, that three different states of the nervous power subsist *at the same time*; namely, an *exuberance*, a *deficiency*, and a *retrograde action*. *The voluntary muscles are the seat of the first and third, and the involuntary of the second*; but whether the deficiency in the latter be the cause or the effect of the exuberance in the former, I shall not at present undertake to determine. I suspect however, it is

* An insensibility to the action of opium frequently occurs in mania, and from a similar cause.

† This remark is, in general, more applicable to tetanus than to hydrophobia.

sometimes the *cause*, sometimes the *effect* of the exuberance, and the consequent inordinate increase of the animal functions.*

XII. Another circumstance which constitutes a *leading feature* of hydrophobia and tetanus, and which will assist in explaining the variety already noticed, is, the great propensity in the nervous power *suddenly to shift its situation*, in such a manner as to cause an *exuberance* where there was a *deficiency* just before, and vice versa. This is clearly evinced by the sudden cessation of the convulsions or spasms in the voluntary muscles, and their being immediately succeeded by *violent palpitations of the heart, vomiting, or retching : or by severe spasms about the throat ; or by convulsive, spasmodic, or retrograde action in some of the other organs :* but it seldom, if ever, happens, that *all* these symptoms are present *at the same time* ; and for this plain reason, that whenever there is an *abundance* of the nervous power in one set of muscles, there is a *proportionate deficiency* in another set.

XIII. Suffocation is the most frequent cause of death happening so suddenly in these diseases, particularly in hydrophobia, from the spasmodic and retrograde action of the pharynx

[* The principles which are here assumed, will be explained hereafter.]

and œsophagus extending to the larynx, trachea, intercostal and other muscles of respiration, *so as to put an immediate and entire stop to inspiration.* But in many instances the patient falls back and dies instantly, on attempting to swallow either food or medicine ; in which case a part of it probably enters the larynx and trachea, causing instant suffocation ; owing to the tongue, and consequently the epiglottis, *being forced forwards*, when the glottis is of course left unguarded.

XIV. Another frequent cause of death, especially in tetanus, is, *the great monopoly and expenditure of the nervous power by the voluntary muscles, from the long continuance of the spasms ; in consequence of which, the heart and large arteries do not receive a sufficient supply of this power, to enable them to carry on their functions.*

XV. The indications of cure, according to this view of the subject, will be clear and simple, viz. 1st. *to restore the balance, in the distribution of the nervous or sensorial power ;* and, 2dly, *the natural, that is, the PROGRESSIVE action, of the muscular fibres.*

XVI. *No medicine, or combination of medicines, administered internally, can be adequate to the production of these effects.*

XVII. To restore the balance in the distribution of the n. p. which forms the first indication (XV.) the superfluous or exuberant portion must be repelled *from the voluntary to the involun-*

tary muscles, (i. e. from the circumference to the centre) which can only be done by some external application capable of giving a sudden shock to the system, so as to diminish the contractility of the fibres of the voluntary muscles, and also the mobility of the n. p.* in the nerves distributed to the latter; to be repeated oftener or seldomer, according to the violence and frequency of the spasms, which will be in proportion to the greater or less tendency to a return of the circumstances mentioned in III, and IV.

XVIII. Cold water seems, a priori, and also from a case of tetanus related in the M. and P. Journal, vol. 10. p. 492; well adapted to fulfil the ends proposed in XVII.

XIX. To restore the progressive action of the muscular fibres, which forms the second indication (XV.) the water should be applied in such a manner as to pass over the body *in a direction contrary to the morbid or retrograde motion of the fibres of the voluntary muscles; for which purpose, and also for that insisted on in Sect. XVII, it should invariably be poured on the head and upper parts of the body*, (the patient being placed in an erect position supported by two assistants;) but in every variety of the disease, the largest part, as well as the force used in applying it, should be principally directed to

* See Cullen's Institutes of Medicine.

those parts of the body most affected with spasm : for example, in hydrophobia or trismus, to the sides of the face, throat and neck ; in opisthotonos joined with trismus, to the back, sides of the face, and neck ; and so in the other varieties. Two or three quarts, of a moderate temperature (about forty of Fahrenheit) would be sufficient to begin with in an adult : gradually increasing the quantity to five or six gallons, and reducing the temperature, if that should be found expedient, as low as the freezing point ; care being taken to wipe the body dry with warm cloths immediately after, and to place it in bed between blankets till the warmth be restored, or the time returns for repeating the application. *

Should this treatment occasion too great a depression of the powers of life, bladders of hot water might be kept in readiness to apply to the stomach, and bottles of hot water or warm bricks to the feet.

XX. *The patient should on no account be urged to take either food or drink, MUCH LESS*

* As a preparatory step to this treatment, and to relieve the spasms about the fauces in hydrophobia, cold water should be sprinkled on the *face, throat, and parts adjacent*, as often as the paroxysm returns. If this should be serviceable, the aspersion might be gradually extended to the chest, belly, and extremities, the body being wiped dry with warm cloths, and removed into warm blankets directly after. In many cases this will perhaps be as much as the patient will be prevailed upon to submit to.

In a practice so new as is here recommended, and a dis-

MEDICINE, *as long as any difficulty in swallowing remains; nor should fluids of any kind be agitated in his hearing: on the contrary, every thing should be studiously avoided which is likely to excite any uneasiness or apprehension; for which reason he should be desired to ask, or if unable to speak, to express his wish by a sign, whenever he feels an inclination for refreshment.* * At such times there would probably be no impropriety in allowing him to take his choice of such beverages as the following.

order so unmanageable as hydrophobia, unforeseen circumstances may easily occur to defeat, not only these, but the most judicious plans art can devise; which renders it utterly impossible to lay down rules applicable to every case. It is highly probable this paper may be found to contain mistakes, both in theory and practice, as well as omissions, which it will be for experience to rectify and supply.

[In order that the cold affusion may produce the proper effect in hydrophobia, I apprehend it will be requisite to carry it to a considerable extent; guarding at the same time, against carrying it so far as to destroy the re-action of the system. I also imagine that the more there may be of ærophobia joined with the hydrophobia; the more necessary it will be to have recourse to this practice, and the more useful does it promise to become.]

* These precautions are as necessary to be attended to in tetanus, *when the spasms extend to the parts contained in the throat and fauces*, as in hydrophobia.

[It is not sufficient merely to refrain from the objectionable practices alluded to above: the mind of the patient should, if possible, be made easy on those heads; and with this view he should be told not to make himself uneasy about

Lemonade, barley water sweetened with honey; gruel, or barley water, with wine, sugar and spice; mulled wine, punch, or good negus; beef tea, broth, &c., *strained through a sieve*: and a saline draught with lemon juice in the act of effervescence, once in two or three hours.

XXI. Principally to procure stools, but partly with a view to nourishment, clysters made of gruel, sugar, butter, and salt, should be injected every three or four hours, till the former

refreshments: that whenever he is thirsty, he may *if he chooses*, try to take of any of the articles mentioned above. But that if he should find any difficulty or aversion in swallowing, *immediately to desist*; as nourishments may be supplied in clysters or otherwise,[†] and the subsequent mention of, or even the most distant allusion to liquids, (except as far as may be absolutely necessary for the employment of the cold affusion,) to swallowing, and especially to the canine species, should be carefully and studiously avoided. And in order to prevent officious or ignorant persons from introducing improper topics of conversation, he should be left in the care of some responsible person, who should be told on no account to permit any person, except the medical attendants, and the immediate friends of the patient to see him.

Whatever other steps may be thought proper to be taken for the relief of the patient's sufferings, these are, in my mind, indispensable.

Might not the dyspnæa, and spasms about the throat and fauces be alleviated by inhaling the vapour of æther, or by smelling to Eau de luce, or acetum aromaticum ?]

[[†] When nourishment is wanted in hydrophobia, or in any complaint attended with a difficulty in swallowing, the tincture of opium introduced by friction, should be combined with the yolk of egg, and a little olive oil, in preference to any thing else.]

effect be obtained.* Should they fail, and the patient be able to swallow with ease (which sometimes happens in tetanus) half an ounce of castor oil should be given in two or three spoonsfull of tartarised infusion of senna, or in any of the above mentioned liquids, every three or four hours, until the bowels become relaxed.

XXII. With a view to the prevention of hydrophobia, excision should *never* be omitted when the wounded part is so situated as to allow of it; and instead of limiting this operation to a few days after the accident, as is usually done, I should be inclined to perform it at any distance of time *under two years*, the disease having appeared as late as nineteen months.†

But where, either from a dislike to the knife, or the wound being so situated as not to admit of its use, this practice is not adopted, the *pure water of kali* should be carefully and diligently applied, as soon after the accident as possible.

* Two or three drachms of tincture of opium might be added to each clyster, should the motions of the stomach be retrograde: but it sometimes happens the sphincter ani is strongly contracted, and the introduction of a pipe has the effect of bringing on the spasms, in which case they should of course be omitted.

† See Trans. of a Soc. v. I. p. 304; and Philosoph. Trans. vol. xl. p. 5.

XXIII. As a prophylactic, *a shower bath*, used two or three times a week for a few months, seems far preferable to bathing either in fresh or sea water, both for preserving that *equilibrium* in the distribution of the nervous power, which is so essential to health, and also for preventing a *retrograde action* of the vessels:* to which should be added, gentle exercise on horseback, a light nutritious diet, with the occasional use of such *laxatives as increase the peristaltic motion of the intestines*.

* May not the good effects of cold affusion in fever be explained upon these principles?

NO. XV.

DIABETES being a spasmodic disease, the phenomena and cure of which are very imperfectly understood, in the management of which the op. fr. may perhaps be occasionally required, and as I mean hereafter to reconsider the subject, I have thought proper to republish the following remarks.

*From the Medical and Physical Journal. Vol. 7.
p. 503.*

.....

I have long entertained an opinion, that the opiate friction may probably be of use in some circumstances of the treatment of most, if not all those diseases which form the third order of the second class of Cullen's Nosology, and have several times, particularly in my first paper, published nearly three years ago, * expressed a firm conviction of its probable utility

[* Now more than ten years.]

in hydrophobia and tetanus. It has been tried with advantage in the latter, and it now appears that a good deal of benefit has been derived from its use in pertussis and cholera, (see No. XI.) all which diseases belong to the class and order above mentioned; but there is another most formidable and in general fatal disease, belonging to the same order and class, in which I think it promises *with the assistance of opium internally*, to be extremely beneficial. The disease to which I allude is diabetes.

It is with great diffidence that I venture to submit the following opinions to the serious and candid consideration of the readers of the Medical and Physical Journal.

I shall not hazard an opinion as to what may in general be the remote cause of this disease; I suspect, however, that it sometimes arises from exposure to cold, accompanied by violent or unusual exercise.

The proximate cause I suppose to consist in an increased action of all the vessels and coats of the stomach, *occasioning an increased secretion of the gastric juice*. I conceive also, that the unusual quantity of gastric liquor secreted, stimulates the internal surface of the lacteals and absorbents of the stomach and intestines, as well as that of the arteries, veins, and emulgent vessels, and thereby increases their mobility, and produces the immoderate discharge of urine, and also the great thirst and voracious appetite;

and this I imagine to be the state of the natural and vital functions in diabetes insipidus.

In diabetes mellitus, I imagine there is not only an *increased secretion* of gastric liquor, but that there is also an alteration in its properties.

If the above representation be founded in truth, (which I believe it to be) it seems to me to suggest a different mode of treatment to any that has hitherto been recommended. The indications will be simple and clear, viz. to evacuate the gastric juice already secreted in the stomach; secondly, to diminish the action of the vessels and coats of the stomach, and thereby the secretion of the gastric liquor; and, thirdly, to obviate or remove the symptoms.

The difficulty will consist in devising the most proper means by which the indications may be best fulfilled. I shall deliver my sentiments in a few words; and I expect that the opinion I have formed of the *Modus Operandi* of Opium, will be of some *practical utility* on the present occasion.

With a view to the first indication, the treatment should commence with moderate vomiting, and for this purpose tartarized antimony seems preferable to ipecacuanha, because it produces a greater degree of nausea as well as diaphoresis; and the most proper time for administering it seems to be, when the sensation of hunger or thirst is most keen, as there

would then be a fair prospect of evacuating a portion of the gastric liquor.

In order to diminish the secretion of gastric juice, which forms the second and *principal* indication, the sensibility, irritability, and mobility of the vessels and coats of the stomach must be diminished; and I know of no medicine so powerful as opium, *internally administered*, in producing these effects; but then it should be given in such doses as will *not* so *speedily* diminish their mobility, as to *increase* the frequency of the pulse; as from three-quarters of a grain to a grain and a quarter, or from fifteen to twenty-five drops of tincture of opium, three, four, or five times in the twenty-four hours; the best time to administer the medicine appears to be when hunger or thirst is most prevalent, and at bed-time.

Its sedative effects however should be guarded against, and costiveness obviated by oleum ricini internally, or by laxative clysters. Its effects upon the circulation should be ascertained by attentively examining the pulse; as this will be the best criterion by which to regulate the dose, and the frequency of its repetition. If the frequency of the pulse is not materially increased primarily, *nor much diminished ultimately*, the dose might be either somewhat augmented, or repeated rather oftener, when the hunger or thirst is pressing, or the discharge of urine not lessened.

Would its efficacy be increased by joining with it small doses of tartarized antimony ; or of ipecac. as in the pulv. ipec. comp. or would nitre and tartarized antimony be preferable in some cases ?

The symptoms which are generally most troublesome, are hunger, thirst, and the frequent and copious discharge of urine.

The two former have already been in part attended to, in speaking of the most proper means to be used for answering the second indication ; and as opium diminishes all the secretions except that of sweat, it seems admirably adapted to every circumstance and symptom of the disease.

Whether the internal or external application acts most powerfully in diminishing the secretion of urine, remains to be tried ; but where the disease is accompanied *by spasmodic affections*, and these are not relieved by the internal use of opium, or where hectic fever is present, I should be strongly inclined to recommend the *external* application.

In conformity with the above idea of the proximate cause, an attention to diet will form a very essential part of the treatment.

It should chiefly consist of such kinds of animal food as are most difficult of digestion ; young meats of every description should there-

fore be avoided, and boiled beef, mutton, pork, tripe, &c. be preferred.

The drink ought principally, I think, to consist of milk both at meals and other times; because it is not always easily digested and is frequently coagulated by the gastric juice, which may blunt and diminish its stimulating qualities; but occasionally, a moderate quantity of brandy and water, or strong green tea, might perhaps be allowed.

The above plan of treatment, judiciously varied according to circumstances and emergencies, seems to me to promise much; should it fail, we must still, I think, rely principally, if we expect to succeed in curing the disease, upon that class of medicines ranked as narcotic sedatives by Dr. Cullen, with the exception of tobacco, wine, and alcohol; and there can be no impropriety or danger in making a cautious trial of such medicines of this class, as may appear, from their known properties, to be best adapted to the indications.

April 8, 1802.

*From the Medical and Physical Journal. Vol. 11,
p. 547.*

THE analogy subsisting between hydrophobia, tetanus, hysteria, and diabetes, leads me to believe, that a method of treatment somewhat similar to that recommended above in hydrophobia and tetanus, (See No. XIV.

Sect. XVIII, XIX, and XXIII.) might be of use in diabetes.

In the early stage of the disease, before the retrograde action of the absorbents is firmly established, I should expect great benefit from the judicious use of *a shower bath*, together with a saline draught in the act of effervescence every four or five hours, *and bitters and purgatives* occasionally; joined with a diet consisting principally of animal food, as advised by Dr. Rollo.

I have not time to enlarge on this subject now; but it may not be amiss to throw out a few hints and cautions, should any one think proper to adopt the plan.

If the disorder be recent, and the patient's strength not much reduced, it might be proper to begin with water of the heat of the atmosphere; but if of long standing, and the patient be weak and hectic, the temperature of the water should be at least 60 of Fahrenheit the first week of using it; and should be reduced a few degrees every week: but if at any time he complains of being shivery and weaker after using the bath, the water should be made a little warmer a few times afterwards, and should never be reduced so low, if it can be avoided, as to cause these inconveniences.

Secondly, As soon as the patient is able to bear it, the cold affusion should be used *instead*

of the shower bath, gradually increasing the quantity of water; and if this agrees, after using it once a day for a short time, and the progress towards recovery be slow, it might perhaps be applied twice a day with advantage: *but the temperature of the water, and the frequency of its application, should always be adapted to the feelings and strength of the patient, the state of the weather, &c.* The proper time for applying it will be in a morning, as soon as the patient rises, or mid-way between breakfast and dinner; and at five or six in the afternoon, should it ever become expedient to apply it twice a day.

Thirdly, The patient should be in *an erect posture* whenever the shower bath or the cold affusion is made use of, and should stand on a board raised and made a little convex, with grooves and perforations to prevent the water accumulating about his feet.

Fourthly, He should be rubbed dry with warm cloths, and wrapped in a warm blanket immediately after using the shower bath or affusion.

Simple and self-evident as some of these precautions may seem, they are of more consequence than at first sight may appear; indeed, the success of the scheme will depend in a great measure on the manner in which it is executed.

May 12, 1804.

NO. XVI.

THE following Cases, Extracts, &c., are adduced in confirmation of the theory advanced in No. XIV. Sect. XVII—XIX, &c.; all together forming an irresistible body of evidence, in favour of the cold affusion in Tetanus.

*From the Medical and Physical Journal. Vol. X,
p. 492.*

.....

“ CASE of OPISTHOTONOS, *successfully treated by*
R. NAYLER, *Surgeon to the Gloucester*
Infirmary.

“ Thomas Organ, 36 years of age, in the parish of Witcomb, about five miles distant from Gloucester, in his usual employ as a husbandman, in the month of February, 1802, had his left hand severely crushed, the second joint of his middle finger much lacerated, and the bone fractured. On receiving the accident, he immediately set off for my house, where, in my absence, the necessary care was taken of him by a young gentleman, then my apprentice. From this time every thing went on as kindly as could be wished, and in the course of a month he was so far recovered with an anchylosis of the injured joint as to enter upon some

of the less laborious parts of his employment. The weather unfortunately for him was at this time very cold and moist, which affected him so much that he returned home early in the evening greatly fatigued and much indisposed. He passed the succeeding night very uncomfortably, distressed by wandering pains in his shoulders and back, and feeling the usual symptoms of what is called a cold. Unwilling however to yield at once, he made another effort the next morning, but soon left his work under an aggravation of all his complaints. He was now bled, took a strong sweating medicine without any relief, he therefore lost more blood, but without the least diminution of his sufferings. In this state I saw him on the third day after his attack, and then found him under a confirmed locked jaw.

“ The muscles of the neck and shoulders every now and then suffered the most irregular convulsions, succeeded by such rigid contractions of those of the back, as to draw his head forcibly backwards at the same time that his chest was considerably elevated, and through which a very acute pain frequently darted to his back. His countenance was frightfully distorted, and bore the strongest possible marks of the agony he suffered. His pulse was about 80 in a minute. He had no preternatural heat, thirst, or indeed any symptom of fever, nor had he felt the least pain in the injured finger. Bladders of warm

water were ordered to his feet, and forty drops of laudanum to be taken every four hours in a camphorated mixture with tincture of castor. His bowels to be kept open by castor oil, calomel, clysters, &c., and blisters were applied on his chest, and also on the cicatrix of the injured finger. These means were made use of several days without any material reduction of the symptoms, though, to give a full trial to what opium could do, there was an increase of twenty drops of laudanum to each dose, given as before, every four hours. At my next visit I found him much more irritable, and every time he attempted to speak or swallow, he became more convulsed, with an apparent aggravation of all his very distressing symptoms. The muscular rigidity had now extended itself to his lower extremities, and, though in a less degree, to his arms also. His pulse was become quick and small, his face occasionally flushed, and he perspired excessively; whilst there was an appearance of stupidity which I could not but attribute more to the imperfect action of the opiate, than any affection of the head. He was now ordered wine freely, to the amount of a bottle in the day, with a strong decoction of the bark and valerian; at the same time a liniment well charged with opium was rubbed into his chest and limbs twice a day, but without producing the least relaxation in the violence or frequency of the spasms. The rigidity

was now become universal, except with regard to his fingers, over which he had a trifling degree of power.

“ In this most deplorable state he reached the fourteenth day from the attack, under the impression on all about him that every paroxysm would take him off; when visiting once more, the application of cold water occurred to me, as having been tried under similar circumstances; and therefore, having combated for some time the prejudices of his surrounding friends against its use, I at last prevailed on them to remove him out of bed, and allowing him as much wine as he could take, (about a tea cup full) whilst supported between two persons, to dash about a quart of cold water over his face, chest, and back, and to repeat the same every four hours, increasing both the force and quantity of the water at each succeeding operation, as he appeared equal to it. *The first experiment gave him so much and immediate relief, that he looked forwards with no small anxiety to a repetition of it at the appointed periods; and pursuing it to the twenty-seventh affusion, his spasms had entirely left him, those affecting his jaw first giving way, and successively those of his chest, back, and extremities.*

“ To recover him from the very debilitated state to which he was reduced, the bark and a cordial diet were continued, till by a gradual recovery he was able to return to his usual

occupation, which he now follows without any remaining inconvenience whatever.

“ It is worthy of remark, that on being taken out of bed to receive the first affusion of cold water, he appeared like a corpse, or one frozen to death. *So rigid and inflexible were all his joints, and his feet so pointedly stiffened, that when placed between the assistants to sustain the operation, he rested on the extremities of his toes only.* It is likewise to be observed, that the large doses of opium joined with the antispasmodic remedies were of no avail, even as palliatives, and that there is not the least ground to conclude that the disease was subdued by the efforts of the constitution. The amendment began with the first external application of cold water, it became progressive as the cold affusions were more frequently and effectually applied, and a complete cure was evidently the result of their continuance. *That the cold bath has been employed in vain in similar cases, is a fact known to medical men.* Are we then to attribute our success in this case to the *less violent*, and mere *local* application of cold? or, if not to these, to what other circumstance are we to impute this favourable event?”

.....

The valuable facts contained in the above history, together with the analogy subsisting between hydrophobia and tetanus, into a firm

belief of which I had long before reasoned myself, had considerable influence in determining me in the choice and recommendation of the cold affusion in hydrophobia. See Art. XIV; S. XVIII and XIX. Such indeed was my conviction of *the extent* of this analogy, as to have induced me to attempt to illustrate and explain these diseases, on the supposition of their being different species of the same genus, in which light I have long considered them; and accordingly have ventured, in the article just referred to, to ascribe the same predisposing and proximate cause to each: see Sect. III and IV: and in the succeeding sections have endeavoured to show, in what respects and circumstances they differ from each other.

I also wished to have denominated hydrophobia in a manner more suitable to these views of its nature and character; but was unable to satisfy myself on this head. The most appropriate name I could think of, was, *tetanus e morsu animalis rabidi*: but having communicated my ideas to my friend Dr. Hull, he suggested, *tetanus hydrophobia*, or *tetanus rabidus*, as being a more appropriate term, and equally applicable to the sense intended to be conveyed; *e morsu animalis rabidi* being added as a definition.

From the Edinburgh Medical and Surgical Journal,
Vol. I, p. 294.

.....

“ HISTORY of a Case of Trismus, in which the affusion of cold water was successfully employed. By Wm. Dalrymple, Surgeon, Norwich.

“ On the evening of the 14th. of September, 1803, Miss E. E., twenty-two years of age, with dark brown eyes and hair, of a delicate and very irritable fibre, being then in perfect health, was seized, whilst drinking tea with a party of friends, with a total inability to swallow, accompanied by a sense of soreness and rigidity among the muscles of the hinder part of the neck. In a few moments these sensations subsided, and were followed by a very painful contraction of the levator muscles of the lower jaw, which, for a few minutes, became violently and immoveably locked.

“ Alarmed by these symptoms, and by the recollection of a recent and severe illness, she made preparations for returning to her house; but, before she was ready to begin her little journey, the spasm completely abated, and her

friends importuning her to continue among them, she yielded to their wishes, and passed the remainder of the evening in perfect ease. In the course, however, of the following morning, she was visited by three or four slight attacks of a similar kind, which, towards the evening, gradually increased in frequency and force, and at length terminated in a firm and permanent contraction of the lower jaw. In this state, accompanied by her mother, she came to Norwich for my advice.

“ From an intimate acquaintance with the extraordinary irritability of my patient's system, and having in recollection a train of very curious, and somewhat analogous phenomena, which, in the course of a former illness, arose from the irritation of worms, I was at first inclined to attribute the present symptoms to the same cause, and to consider the present complaint as a modification of that species of spasm which Sauvages has denominated *Trismus Verminosus*. Upon inquiry, however, I discovered that, about three weeks previously to the commencement of this attack, my patient had accidentally trodden upon a thorn, which penetrated her shoe, and entered the sole of her left foot, near where the first phalanx of the great toe is articulated with its metatarsal bone. The wound was indeed so slight and superficial, that, having removed the thorn, she proceeded without inconvenience in her walk, and did not

immediately recollect the accident, when I asked her concerning it.

“ Upon examining the foot, a minute speck of hardened blood, not larger than a small pin's head, was still perceptible in the skin where the thorn had entered; but not the faintest vestige of inflammation now existed, nor did pressure upon the part, at this time, occasion the slightest pain or agitation.

“ At this moment, the spasmodic affection, which constitutes that important disease called trismus or tetanus, appeared in its simplest form. The patient's respiration was free and easy; her pulse calm and natural. She was void of pain, and her mind in a state of perfect composure. She complained, indeed, that, in the course of the preceding night, her rest had been disturbed by frequent and painful twitchings in the muscles of the neck and arms, which had left those parts, especially the former, rather tender to the touch, and more than ordinarily susceptible of impressions of cold. These tremulous motions, however, were no longer perceptible, and, exclusively of the spasm upon the jaws, which had now been closely locked nearly 18 hours, her feelings and appearance were those of moderate health.

“ *Denied access to the stomach by the firmness of the spasm and the perfect regularity of my patient's teeth, I was under the necessity of confining myself to the use of external remedies. A*

blistering plaister, extending all over that part of the temporal muscle which is not covered with hair, and reaching downwards to the lowermost termination of the masseter muscle, was accordingly applied to each side of the face, and another, very ample in its size, was adapted to the nape of the neck. An ointment also, composed of one ounce of the stronger mercurial ointment, and two drachms of finely powdered opium, was prepared, and an eighth part of it directed to be most diligently rubbed into the skin, at the inside of the thigh and upper arm, every two hours.

“*September 16.*—At 12 o'clock this morning, three drachms of opium, with a proportionable quantity of mercurial ointment, had been consumed in the different frictions, which, I am satisfied, have been carefully performed. Not the slightest abatement of the spasm has taken place. The jaws are now so closely locked, that I am not able to introduce the point of a very thin steel spatula between them. The preceding night was passed without sleep, but quietly; no return of the twitchings in the neck or arms have occurred. A small quantity of fluid jelly and of wine has been sucked in between the teeth, but complaint is made of great difficulty in swallowing it, and of frequent and sharp pains darting along the sternum and at the scrobiculus cordis.

“ *September 17.*—This morning, appearances are still less favourable than yesterday. The blistering plaister, which was applied to the nape of the neck, appears to have relieved, in a slight degree, the stiffness and soreness complained of in that part; but the spasm upon the jaws remains unaltered. A painful sense of heat is felt in the mouth and throat, and a very small quantity of liquid nourishment has been swallowed with increased difficulty. The night was sleepless and unquiet, rest having been disturbed by twitchings in the neck and arms, and her mind filled and harassed by frightful imaginations. The pain along the sternum is constant and severe; that at the pit of the stomach peculiarly pungent. The frictions have been regularly and diligently made. The effect of the opium upon the system is scarcely to be perceived; but the gums are manifestly affected by the mercury.* The bowels have

[* I beg leave to observe, that this explains very satisfactorily to my mind, why the effect of the opium upon the system was scarcely perceptible. For if two articles possessing opposite qualities, (opium and mercury, or opium and cantharides for instance) be given at the same time, either internally or externally, the effect produced will depend upon the comparative power of the different ingredients, their proportions with regard to each other, and the peculiarities in the constitution of the patient. In other words, they will so effectually counteract each other, as either to render the compound inert, or that article which possesses the preponderating influence, will produce the usual effects, though these will be in

been relieved twice since the beginning of the complaint: the urine is small in quantity, and voided with considerable pain.

“ At my visit on the 18th. I found most of the symptoms of the preceding day still more strongly marked, and, in addition, Miss E. complained of great uneasiness at the root of the tongue, accompanied by a constant feeling of fulness of the throat, *arising to a most distressful sense of suffocation*, whenever she attempted to swallow the saliva, which was secreted in unusual abundance. Slight convulsive motions of the muscles of the face, particularly of the frontal muscle, were now perceptible. Her breathing was short and quick; her pulse frequent and fluttering. During the night, which was sleepless, and passed under great agitation of mind, she was much annoyed by hiccup, *which increased the severity of the pain at the pit of the stomach*. Her thoughts were perturbed and anxious; she sighed deeply and often, and the expression of her countenance, which is naturally mild and cheerful, was grim and gloomy. Although she made no reference whatsoever to the accident in her foot, *when pressure was applied this morning to the little speck which I have already mentioned, the muscles of the face and arms were immediately convulsed, and increased pain was felt about the throat and jaws. As soon,*

a less degree than if it had been administered alone; while the other will of course produce little, if any, *sensible effect.*]

however, as the pressure ceased, the muscles of the arms became quiescent, whilst the twitchings of the face continued to recur at frequent and irregular intervals.

“ In this state of things, a consultation was requested, and Mr. Martineau of this city, who was particularly known to my patient's friends by his successful treatment of a similar case in the neighbourhood of their residence, was called in. At our joint visit on the 19th. we found appearances much the same as I have just described them. With respect to the treatment which had lately been pursued, I have to state, that, since the morning of the 17th. current, the mercurial frictions had been discontinued, in consequence of their effects upon the salivary system; but although simple lard having been substituted for mercurial ointment, the use of opium had been regularly persisted in. No advantage of consequence appeared to have been derived from its application; the violence of the spasm upon the jaws remained undiminished, and the other symptoms of the disease had been gradually unfolded and established. Indeed, with regard to the operation of opium in this case, its effects upon the system were by no means conspicuous, although, within the space of 76 or 78 hours, no less a quantity than ten drams had been used. The pains of the pit of the stomach, and along the sternum, were,

however, somewhat relieved by the joint use of that medicine and warm spirituous fomentations applied to the parts.

“ At the suggestion of Mr. Martineau, it was determined to propose and make trial of cold affusion. *Its effects were beyond our most sanguine expectations. Scarcely was the fourth hand-bason emptied on the head of our patient, when, heaving a deep sigh, and fainting as the water fell around her, the spasm dissolved, and we had the satisfaction of beholding the jaws widely extended.*

“ The shock upon the frame was excessively severe. In none of the instances in which I have had occasion to employ this powerful remedy (they have, it is true, been uniformly cases in which the temperature of the body was preternaturally high) has its influence in diminishing the action of the living powers been comparable to that which it displayed on the present occasion. Respiration was suppressed; the heat of the surface, which, throughout the illness, had been moderate and natural, was extinguished; the pulse at the wrist entirely suspended; and, for a few seconds, a feeble fluttering of the heart seemed rather the harbinger of death than of renewed or reviving health. I confess I was a little alarmed at first: appearances, however, soon began to mend. Warm blankets were in readiness, and a glass of hot wine having been swallowed, the patient was conveyed

to bed, and frictions over the whole surface were immediately and diligently employed. In a very few minutes the powers of life revived. Respiration recommenced; the pulse returned to the wrist; the heat was gradually restored; and, after taking a small quantity of nourishment, she fell into a sound sleep, which lasted several hours.

“ On the following morning (the 20th. of September), I found my patient in a state certainly of extreme debility; but, in every other respect, her situation was very satisfactory. The jaws remained free from spasm; the tremours of the face and arms had ceased; her mind was calm and serene, and the pains at the præcordia were much abated.

“ In short, from this time, the progress of the cure was uninterrupted, and Miss E. gradually recovered her usual state of health.

“ Such is the simple history of this interesting disease. I purposely forbear to add any minute and unnecessary remarks. I would, however, observe, in general, that if I am correct in the judgment which I have formed concerning the nature and origin of this affection (I readily admit that they are not indisputable), another fact is added to our scanty experience on this subject; and as far as a single observation extends, we may henceforward proceed with increased confidence and success in the treatment

of that variety of *trismus* which arises from local injury. ”

“ WILLIAM DALRYMPLE. ”

Norwich, April, 1805.

IN the Medical and Physical Journal, Vol. XV, p. 496, a Case of Tetanus is recorded by Mr. Dashwood. The complaint arose from cold, and was treated for a week by *warm* bathing and blisters, with the *internal* use of purgatives, opium, mercury, &c. ; which are said to have afforded *temporary* relief: but the complaint continued to increase till recourse was had to the *cold affusion*, (at the suggestion of Mr. W. H. Crowfoot, *who had seen it employed with success in a case of tetanus at St. Thomas's Hospital ;*) which was so grateful and beneficial, that the patient wished it to be repeated, and the day following was able to stand, and move her limbs, &c. ; and ultimately recovered.

From the Edinburgh Medical and Surgical Journal. Vol. 4, p. 45.

.....

“ *A Case of Tetanus successfully treated with the Cold Affusion. By D. ARNOLDI.*

“ Mr. Julien Perrault, ætat. 32, of a healthy and robust constitution, was seized with a slight stiffness about the neck, on Monday the 7th. July 1806, which did not greatly incommode him for a day or two, when he perceived some degree of rigidity in the muscles of the jaw, and a sense of soreness in the throat, for the relief of which he applied to me on the Thursday following.

“ Considering his complaints to arise from a cold, advised bathing his feet in warm water, and a paregoric at bedtime, which relieved the symptoms while he was warm in bed; but he got up in the night, which was very sultry, and sat outside of his door a considerable time, which evidently increased the rigidity of the muscles of the jaw. Saturday night, the bath and opiate were repeated, and an infusion of senna and salts exhibited very early on the Sunday morning, which operated plentifully.

“ About nine o'clock, (Sunday) finding all the symptoms aggravated, and the trismus more

distinct, the powers of deglutition considerably impeded, I inquired more particularly into the patient's previous health, which, however, could not afford me the least indication of the cause of this disturbance, as he had enjoyed a very good state of it long before, nor was it till after very minute inquiry, that he recollected having wounded his little toe in cutting a corn, that was situated on the extensor tendon; it had never inflamed, but by attentive observation, a distinct point of blood could be perceived through the transparent induration, although it was upwards of three weeks that he had cut it. Alarmed at these appearances, I advised his friends to call in further assistance. They, accordingly, called in Mr. Blake, who saw him the same day (Sunday) about two o'clock; the rigidity of the neck and jaw were increased, and the spasms frequently affected the whole of the muscles of the back and breast; the jaw was locked to such a degree, that it would not admit the handle of a spoon between the teeth, and the muscles of the face were likewise strongly affected. After having consulted upon the case, it was agreed to try the cold affusion, which was immediately done. Previous steps having been taken for it, six buckets full of cold well water were poured on his head, while in a tub, which had been brought into the house, but finding the operation so severe, he would not bear any more, but got out of the tub, and was put to bed in warm

flannels, and a tumbler of warm wine and water administered, with forty drops of laudanum. He was scarcely warm in bed, before the spasm on the jaw evidently relaxed, and he could open them sufficiently wide to admit the little finger. We left him considerably easier about three o'clock, and called again the same evening, accompanied by Mr. Loedel, about seven. It was determined to repeat the affusion, to which the patient consented, with the greatest reluctance; the very idea of it aggravated the spasms: however, we got him into the tub again, but he would not endure more than three or four buckets full, and made his escape. He was again wrapped in warm flannels, the warm wine and water, with fifty drops of laudanum, administered; but the beneficial effects of the affusion were not so evident as before.

“ The patient peremptorily declined to submit to it any more. Monday the 14th. we met all three about nine o'clock, the symptoms were all aggravated, and the spasms were very severe about the scrobiculus cordis, the rigidity extending down the extremities. We would have persisted in the affusion, but were absolutely opposed; we then determined to try the effects of mercury, and immediately had half an ounce of the strong mercurial ointment well rubbed into the thighs, and his arms and legs embrocated with a mixture of equal parts of laudanum and tincture of cantharidis, and the laudanum

exhibited to the extent of sixty drops three or four times a day, with a bolus of ten grains of calomel at bedtime. We met again at seven o'clock, P. M. and found him much worse. The frictions and opiate were continued in more liberal doses. — Tuesday, we found him still worse; the spasms were more frequent, and so violent at the pit of the stomach, that it almost prevented his breathing; the muscles of the back were more contracted, and he exhibited the true ophisthotonos to such a degree, that, when he lay on his back, a pillow might with ease be put under his loins. The muscles of the abdomen were very tense; his thighs and legs were as hard as a board. The frictions and opiates were continued very liberally, and ten grains of calomel given at bedtime. — Wednesday, we found all the symptoms aggravated; the spasms on the scrobiculus cordis, exceedingly severe and long; the muscles of the neck horribly contracted, and a facies hypocratica rendered him a terrible figure indeed. The mercury evidently affected his mouth, as there was a swelling of the gums and inside of the cheeks; he was scarcely able to swallow his spittle, and all this time he subsisted by sucking broths miserably through his teeth. As he still continued obstinately to oppose the affusion, his friends, warned of the danger, had called in his spiritual director, an old friar, who, with the assurance so common to presumptuous igno-

rance, said he would cure him in very little time, which they readily believed, as he passes for a dabster in medicine; and, accordingly, he set about stewing some hemlock-tree branches, (Wednesday evening,) with which he meant to sweat him by covering him with the reeking branches. He actually submitted to the treatment, but the spasms increased to such an alarming degree, that they drew him out of the bath with great precipitation, and he passed the rest of the night very miserably, although he had still continued the tinct. theb. of which he had in all taken, at this time; about two ounces, besides what was rubbed on his limbs. Our attendance was rather intrusive; but, being anxious about the event, we continued regularly to attend twice a day, since the last affusion, and the frictions were only submitted to through mere complaisance, as the friar was all this time carrying on his plans.

“ However, as he was costive, two ounces of castor oil were ordered at bedtime, which operated three times very well, and brought off a worm of the Lumbricus kind.

“ Not finding the expected relief from the old friar, and perceiving his danger, of which he could not be convinced before now, although exposed to him without the least reserve, and that the disease was making rapid strides, besides the pains and distress he was in, he at last

begged to have the cold water poured on him again.

“ We had assiduously avoided speaking of it these few days past, for fear of aggravating the spasms, as he was seized with horror when any mention was made of the cold water, which gave rise to the risus sardonicus to a dreadful degree, and the pain at the scrobiculus, that was so sore to him; the effects of the mercury were very evident, and a slight salivation induced.

“ Thursday evening, having prepared a large tub out of doors, with a chair secured in it, he was placed in it, as stiff as a board, every muscle in his whole frame in a violent state of contraction, and his head and heels forming a considerable arch. Upwards of twenty-six buckets of water were poured directly on his head, so as to run down before and behind, when we perceived his pulse to flag, and he sunk down on the chair; we immediately desisted; the diliquium produced a solution of the spasms, as his limbs became flexible, and the jaw dropped.

“ We were apprehensive of having carried it too far; but we had the consolation, in a few minutes, to find the reaction commence, by the help of the warm flannels and wine. The jaws were so much relaxed, that they could separate almost to their full extent. We ordered him his laudanum (seventy drops), and left him highly satisfied with the effects of the affusion.

“ Friday, we found him in high spirits, as there was an evident abatement of the spasms, although the trismus had returned, but the spine was not so much bent, and the pain at the scrobiculus cordis not nigh so frequent or distressing. He passed but a restless night, as he was disturbed by a diarrhœa, that wrought him fifteen or sixteen times ; the salivations had not increased, and the frictions had been discontinued since Wednesday, but the opiates were given to their usual extent, four or five times a-day. In the evening, we put him in the tub again, and poured on twenty buckets of water, when his pulse lowered, and his knees bent, so that he sat down on the chair ; we immediately got him out, and put him in the warm flannels, as usual, gave him the wine, as before, and found the jaw quite relaxed. He was sooner recovered from his fainting than last evening, and could swallow better ; we left him, with directions to take the laudanum, as the pain at the stomach might require, which was but seldom ; so that the quantity and frequency of its exhibition was gradually diminished to thirty drops twice a-day, and at last discontinued.

“ Saturday, we found him in every respect better, as he had made shift to take some food, but complained sorely of his tongue and teeth ; he had slept pretty well for the first time since the Saturday before. The spasms being much diminished, we thought that the affusion might

be dispensed with, as it was a measure that carried with it such an air of severity ; we advised him to drink plentifully of good Madeira wine, and take as much nourishment as he could.

“ Sunday morning we found him quite merry, having drank two bottles of wine, and slept tolerably well, except when the attendants plied him with wine. He began to walk about with a little support, but he yet cut a ludicrous figure. No medicines were ordered, and the wine was continued.

“ Monday, the appearances were yet more favourable, and he could make a better use of his limbs ; his jaw was relaxed sufficiently to eat a little bread and biscuit, but his tongue was sore yet ; his features were gradually assuming their wonted appearance. He had drank two bottles of wine since the last report, and staggered about rather better than yesterday. Finding matters go on so favourably, we recommended the same plan, which he continued with little variation for twelve or fourteen days, when there was no rigidity of consequence remaining, and he gradually returned to health, lessening the quantity of wine by degrees.

“ I have stated the above case merely as a succession of facts, which you are at full liberty to make what use of you please, and have forbore making any comment of the treatment ; but I am strongly inclined to think, that the benefit to be expected from the cold affusion

will be very little, unless it is carried to the length of producing a suspension of the vital principle, as the spasms were very markedly dissolved on the deliquium taking place, and their recurrence with the reaction, with an evident abatement. He had taken, in the course of ten days, besides the frictions, nearly three ounces of the thebaic tincture, without inducing the least stupor; nor did we perceive any bad effects from the cold, although very much under the influence of mercury. There was nothing in the discharges by stool that might indicate any irritation in the alimentary canal, either as to quantity or quality, as his evacuations were natural, excepting the solitary lumbricus, which could hardly be suspected of having created so much disturbance. The wound on the toe never exhibited any appearance of inflammation, nor could we perceive that it gave him any unusual pain on pressing strongly on it. His pulse was not disturbed during the whole course of the disease, except from the effects of the affusion.

“ At this date, which is upwards of a year since his illness, he has enjoyed an uninterrupted state of health, has got fat, and was married eight months ago.

“ While drawing out this sketch, he informs me that he recollects having had a diarrhœa which lasted a day, a few weeks before his

illness; in his stools, he noticed several small worms, but never observed them before or since.

“ It may be worthy of remark, that the weather was very sultry during the latter part of June, and all July; and there was very little variation in the thermometer, night or day. ”

Montreal, August 12th., 1807.

THE following very striking instance of the success of the cold affusion in tetanus, was communicated to me by Dr. Bardsley.

“ Mrs. N. æt. 41, of an irritable habit, was seized, July 17th. 1808, with an uneasy stiffness in the muscles of the neck and shoulders, originating as was supposed from rheumatism, to which the patient had been occasionally subject. These symptoms on the 18th. were accompanied with a sense of general lassitude, and an oppression about the præcordia. On the evening of this day some difficulty in swallowing and opening the jaws, with a spasmodic stricture about the sternum, were first noticed. The assistance of a neighbouring practitioner was now called in, who, finding the bowels constipated, and the pain and tension in the muscles subservient to deglutition momentarily increasing, ordered a brisk purgative; and after

its operation, opium both by the mouth, and in clysters. — Notwithstanding the bowels were freely opened, and pretty large doses of castor, asafœtida, and opium had been exhibited, still the tetanic symptoms increased to an alarming degree. — The jaws were firmly locked for two or three hours, and on moving the head in any direction, general spasms of the muscles of the neck and breast supervened. Blisters were ordered to the breast and back; and large doses of valerian and opium, whenever the mouth could be opened, were with some difficulty got down. On the 19th., at eleven o'clock in the forenoon I was called into consultation. I found the patient so afflicted with spasms, as to require three persons to hold her down upon the bed. The tongue had been much lacerated by the teeth suddenly snapping upon it, during an interval of relaxation of the jaw. The spasms under the cartilago ensiformis were suddenly and painfully excited, and darted with rapidity from this point to the back, neck, and shoulders, forcing the head towards the spine; which also became rigid and incurvated. The pulse was small, quick, and irregular; the breathing short, and interrupted; and the countenance expressive of the greatest agony. I immediately ordered the patient to be removed (as soon as a remission of the violence of the spasms would permit) from bed into an adjoining closet; where she was placed naked upon a stool; and in this

situation a large bucket full of cold water, brought fresh from the pump (the weather being unusually hot) was first dashed upon the neck and breast; and then another over the lower part of the body and extremities. The patient was instantly wrapped in a blanket, carried to bed, and rubbed dry with warm cloths. In a few minutes a considerable moisture appeared upon the whole surface of the body;—the rigidity of the muscles abated, and the patient, with comparative facility, swallowed some warm wine and water:—The pulse became soft, moderate and equable; and the patient expressed her conviction of the great utility of the remedy. The affusions were ordered to be repeated according to the urgency of the spasmodic affections: at all events the operation was to be renewed once during the night, and early in the morning. 20th. ten o'clock A. M. The patient had passed a tolerable night.—She felt but little oppression at the sternum, but still complained of great soreness in the muscles which had been subject to spasm, and an inability to open the jaws beyond a limited extent, and some difficulty in the act of swallowing. The cold affusion was ordered to be repeated thrice during the day; and bark and wine, with a nourishing diet were prescribed. This plan succeeded so well that on the 21st. the patient became free from spasms, the power of swallowing was nearly restored, and by the aid of the tonics and regi-

men prescribed, recovered her wonted degree of health and strength in the course of twelve days from her first seizure. ”

DR. BRIGGS, Physician to the Liverpool Dispensary, has lately published a case of tetanus in the Edinburgh Medical Journal for April 1809. The cure is attributed principally to purgatives; though the cold affusion, and opium both internally, and externally, were also employed. In speaking of the affusion, Dr. Briggs says, “ The cold affusion appeared, at first, to be eminently useful, but afterwards hurtful. I suspect that this difference was owing principally to the *larger quantity* of water used in the latter applications, to which I was led, by a case in the Edinburgh Medical Journal for January 1808, stated as having been cured by this plan pushed ad deliquium. I remember, too, that my patient was in a state of perspiration at the time when he underwent the last affusion. It is also noted in the report, that his mouth was sore; but I am not sure that the perspiration was more than it had been on many former occasions; for it was almost constant: and again, the patient who is said to have been

cured by it, was *under a slight salivation.*" — Of the latter he says, " The whole quantity of opium taken *internally*, was gtt. xl. of the tincture on the 15th. and gtt. lx. on the 16th; and so far from answering any good end, it seems manifestly to have *prevented* sleep, as well as to have *impeded* the operation of the purgatives. But, on the other hand, the *external* use of opium *appears to have been beneficial throughout the whole course of the disease, more especially in the latter stages.*

" A medical friend has suggested, that possibly the same good effects might have resulted from the same degree of friction, with camphorated oil, or even with simple oil; and certainly the quantity used in seventeen days, from the 14th. to the 31st. (being only six drams of opium, and two ounces of the tincture), appears very inconsiderable, when compared with that which Dr. Currie's patient took internally within fifty hours!

" Still I am inclined to believe, that the relief which the patient *always* experienced from the friction, was owing to the opium, and were such another case to occur, I think I should employ it to a much greater extent, suspended in oil, with a large proportion of camphor."*

[* This proposal to employ camphor along with opium by friction, in tetanus, seems to me extremely objectionable; first, because by occupying a certain space in the preparation, whatever may be its form, it weakens it, (one grain of opium

With a zeal and humanity well worthy of imitation, it is observed in a former part of the history; "This day and the following, were

being equal to three of camphor; it is also quicker in its operation,) and consequently prevents so large a quantity of opium from being absorbed as might otherwise happen. Secondly, the properties of camphor introduced by friction, have not been so fully ascertained, as to enable us to say how far we may venture to substitute the one for the other, which would require many experiments. There is one disease however, *viz. gangrene*, in which, if we may reason from experience, we shall be justified in introducing camphor along with opium; for apparently, nothing could be more speedy, or more happy in its effects, than their joint operation in the case of Bayley, (see No. V and X), yet it will be prudent to suspend our opinion, until opium alone shall have been tried, under circumstances exactly similar. Besides, there are reasons for employing camphor along with opium in gangrene, which do not apply to tetanus, hydrophobia, &c. 1. The disease is not usually accompanied by spasms or convulsions; 2. On account of its antiseptic properties; 3. *It has been tried combined with opium in various instances of gangrene, and found highly serviceable.*

A small proportion of camphor (five grains) was first added to the opium employed by friction, in a case of severe head ache, by Dr. Percival, who gave as a reason that it dissolves the opium, and renders the composition so smooth as to fit it for absorption. But this can only apply when the powder is used, and if this be made sufficiently fine, camphor is unnecessary, as has been proved on various occasions. For my own part I do not recollect having used them jointly except in two or three instances. The effects were certainly beneficial, but not more so than I have often observed from opium alone.]

days of extreme perplexity with me. I had all along been aware of the awful responsibility I incurred by departing so widely from the usual practice in tetanus, and now my resolution failed me altogether. I was terrified with the apprehension that I had already delayed the free exhibition of opiates too long, and I determined to have immediate recourse to them, while yet I was loth to relinquish the use of purgatives. Fortunately I had this day met with a medical friend, who has had opportunities of seeing various plans tried for the treatment of this terrible disease, and from him I learnt, that though his experience had taught him to depend chiefly on *opium*, administered in large quantities, both *internally* and *externally*, yet, of the two, he thought the *external* application the more efficacious; whence I was willing to hope that, by the more diligent use of the *opiate friction*, conjoined with active purges, the good to be expected from either plan might be secured, I therefore ordered &c."

THE first of the above cases, (that of Thos. Organ) was the only one of which I had any knowledge when I drew up the Outlines No. XIV. of the cold affusion having been employed

in tetanus. The others were not published till some time after, as the dates will shew.

Long before any of these had appeared however, viz. in 1779, Dr. Wright had published an account of six cases of tetanus, in which *the affusion of cold water* had been employed with the most complete success. * And ten years afterwards, viz. in 1789, we find it mentioned in the following very favourable terms by Dr. Cullen ; both of which facts were totally unknown to me at the time : at least, if I had ever seen them, which is not impossible, the impression was completely obliterated from my memory : consequently I could not help thinking it fortunate for my theory to meet with so many satisfactory and decisive proofs, and from such excellent authority, in favour of a doctrine which I had taken some pains to explain and inculcate.

“ In the former edition of this work, (says Dr. Cullen) among the remedies of tetanus I did not mention the use of *cold bathing* ; because, though I had heard of this, I was not informed of such frequent employment of it as might

* “ Since I used this method,” says he, “ I never failed, in one instance, to effect a cure ; and that in a shorter time, than by any other method hitherto proposed.” — Mr. Drummond also speaks of it in the highest terms. Medical Observations and Inquiries. Vol. 6. Art. 13.

confirm my opinion of its general efficacy ; nor was I sufficiently informed of the ordinary and proper administration of it. But now, *from the information of many judicious practitioners who have frequently employed it, I can say that it is a remedy which in numerous trials has been found to be of great service in this disease ; and that, while the use of the ambiguous remedy of warm bathing is entirely laid aside, the use of cold bathing is over the whole of the West Indies commonly employed.* The administration of it is sometimes by bathing the person in the sea, or more frequently by throwing cold water from a bason or bucket upon the patient's body, and over the whole of it : when this is done, the body is carefully wiped dry, wrapped in blankets, and laid a-bed, and at the same time a large dose of an opiate is given. By these means a considerable remission of the symptoms is obtained ; but this remission, at first, does not commonly remain long, but returning again in a few hours, the repetition both of *the bathing* and the opiate becomes necessary. By these repetitions, however, longer intervals of ease are obtained, and at length the disease is entirely cured ; and this even happens sometimes very quickly. I have only to add, that it does not appear to me, from any accounts I have yet had, that the *cold bathing* has been so frequently employed, or has been found so commonly successful in the cases

of tetanus in consequence of wounds, * as in those from the application of cold." First lines of the Practice of Physic. Vol. 3, p. 307.

It will scarcely be credited, yet such is the fact, that after such unparalleled success in the treatment of tetanus by *the cold affusion*, as it was practised by Dr. Wright, and afterwards recommended by Dr. Cullen in the passage which I have just quoted, it should have fallen into an almost total disuse, for a period of near twenty years. This, I apprehend, has arisen, partly from the terms "cold bathing" and "cold bath" having been unfortunately substituted for *cold affusion*, at the commencement of this practice, † which has occasioned these different methods of using cold water to be employed indiscriminately: and partly from medicines of various kinds having been exhibited

[* Two of Dr. Wright's cases of tetanus, the 2d. and 4th. arose from external injury; and in the 6th. the patient was afflicted with the *coccobia*, or joint evil, which baffled all the art of medicine. "It produced its usual and direful effects of destroying the fingers and toes." A few weeks previous to the attack "his disease broke out with uncommon violence in the right foot, and seized the metatarsus, *with most excruciating pains*." Three of the four cases quoted above were also of the traumatic species of tetanus.]

[† I should rather have said at its *revival* by Dr. Wright, to whom it was suggested by Dr. Lind. From whom he had it does not appear; but Dr. Falconer has traced it as far back as the time of *Hippocrates*, who was evidently in the habit of employing the *cold affusion*. See Memoirs of the Medical Society of London, Vol. 2. Article 8.]

either internally, or externally, (*or both*) at the same time; which were calculated to defeat the good effects of the *cold affusion*, and of course to disgrace the practice. — Dr. Wright, Mr. Drummond, and Dr. Cullen, all employ the terms “cold bathing” and “cold bath” when speaking of *the cold affusion*; but this error, if such it can be called, is in them an extremely venial one, as they have described the whole process in such very plain terms, as could not, one would have supposed, have been mistaken.

The following remarks were published in *March*, 1807, as a supplement to the *Outlines on Hydrophobia and Tetanus*. See No. XIV.

The observations themselves, as well as the occasion which called them forth, may be seen by referring to the 17th. volume of the *Journal*, page 353 — 361, and 457 — 460.

NO. XVII.

In the present alarming emergency, * it

* [About that time (the winter and spring of 1806-7,) the inhabitants of London and its Environs, had experienced a degree of consternation unknown at any former period, in consequence of several persons having been bitten by dogs supposed to have been mad; which occasioned a general outcry against mad dogs, and other unpleasant reports to be circulated. The alarm had also extended to some of the large towns in the centre of the kingdom.]

may perhaps be excusable so far to anticipate my intended publication, as to mention briefly the plan of cure which will there be recommended, and which I have long since conceived, as the result of a train of facts and arguments, as what appears to me the best that can be adopted in hydrophobia and tetanus, but particularly in the former; agreeing in many respects, (but differing materially in others, chiefly in being more comprehensive,) with that which I ventured to propose nearly three years ago.*

The rationale of the above mentioned plan of cure, is partly as follows.

The exuberance and retrograde action † originate in the wounded or lacerated part, and are propagated from thence along the nerves, by means of what I shall take the liberty to call, THE HYDROPHOBIC, OR TETANIC AURA, to the muscles affected with spasm.

The retrograde motion of the *aura* is manifested by a sense of uneasiness or pain, commencing in the injured part, which is immediately succeeded by shooting pains *proceeding upwards*, from thence to the diaphragm, the viscera of the abdomen and thorax, muscles of deglutition, respiration, &c.; these being fol-

* The evident connexion between the principles laid down in the extracts now about to be transcribed, and those contained in No: XIV, may be seen by comparing them together.

† See Art. XIV, S. IV.

lowed by an immediate and often violent increase of the spasms.

It appears to be chiefly through the medium of the sympathetic and recurrent nerves, the par vagum, and the branches of these which communicate with the other nerves which supply the viscera of the abdomen and thorax, that the hydrophobic and tetanic aura has access to the parts most affected with spasmodic and retrograde action; as the œsophagus, trachea, muscles of deglutition, and of respiration; the heart, stomach, intestines, abdominal muscles, &c. &c. There is also great reason to believe, that the recurrent nerves are the principal agents employed in producing the characteristic symptom of hydrophobia, a dread of water.

INDICATIONS OF CURE.

The indications of cure, according to the above hypothesis, will be, 1. *To intercept the AURA, or retrograde nervous impulse, (see above) in its passage from the injured part, to the centre and source of the nervous system.**

* [In many cases, this, I fear, will be impracticable; but my opinion is, that in hydrophobia where the disease is fully formed, and is of the very worst kind; as well as in some cases of tetanus traumaticus, it must either be attempted, or it will be in vain to expect success. I also think, if this were accomplished without injuring the functions of any of the vital organs, the other indications would be easily fulfilled.]

2. To appease the tumult in that part of the nervous system, situated in the anterior, posterior, and lateral parts of the neck and throat, from the clavicles upwards, as high as the ears and chin. 3. To restore the equable and regular distribution of the sensorial power, amongst the different classes of nerves, muscles, &c. And, 4. To restore *the natural*, that is, THE PROGRESSIVE *action* of the muscular fibres, generally throughout the body.

In order to fulfil the first, and most important of these indications, there are two methods of proceeding, which, according to my judgment, promise exceedingly fair to be attended with success, in many cases both of hydrophobia and tetanus; the attending physician or surgeon exercising his judgment, as to which will be most expedient in each individual case, until experience shall have determined to which the preference is due.

The first is, to apply a caustic, (the calx cum kali pura which I recommended for this purpose three years ago, seems to act most speedily and certainly,) at the distance of from one to three or more inches, (according to the situation and course of the offending nerve,) *above* the bitten or wounded part, removing the eschar, and repeating the application oftener or seldomer, according to the effect produced.

The other (and by far the most effectual where it can be safely practised) method of *inter-*

*cepting the aura, in its passage from the injured part to the center and source of the nervous system, is, to divide the nerve (or nerves) which forms the medium of communication between the topical affection and the brain, or spinal marrow.**

* [In the trismus dolorificus of Sauvages, or Tic Douloureux, different branches of the 5th. and 7th. pair of nerves have been divided with the most complete success, after other methods of treatment had failed. And "It is worthy of remark," says the ingenious Dr. Haighton, who first performed this operation in this country, "that the sensation and action of that side of the lip, though evidently diminished, were not altogether lost, as might have been predicted. *The inconvenience was only temporary; we may therefore suppose a reunion of the nerves had taken place, but with this fortunate effect, that no disposition to the return of the disease through the new formed part has yet appeared.*" See Med. Rec. and Res. — About the same time (1798) Dr. Darwin pointed out, in a letter to Mr. Cruickshank, the expediency of dividing the affected nerve in a similar case, which likewise succeeded completely. The operators in this case were Mr. C. and Mr. Leigh Thomas. See Zoonomia. — And whenever a case of hydrophobia shall occur, where the wound shall happen to be so situated as to render the operation which I have ventured to propose admissible, *in an early stage of the disease*, (as on the hand or fore arm, leg or foot, e. g. the nearer to the fingers and toes the better; which fortunately will include the major part of the cases which actually occur;) we shall be able to ascertain how far the principles which are here advanced, and which I have uniformly endeavoured to maintain, are well founded. The bare mention of such a scheme in any common case, would justly subject the proposer to the severest censure: but who that has witnessed the tortures of a person afflicted with the true hydrophobia, (or even those which are often experienced in

It may be useful in either case, in enabling us more easily to discover the nerve to be operated upon, *to apply pressure* by means of a tourniquet or otherwise, *above* the part affected :*

tetanus, which are sometimes equally frightful, or nearly so,) and is aware of the consequences, would withhold his assent, even though it were certain to be succeeded by the loss of sensation and motion in some particular part; supposing there were the smallest chance of his getting rid of such complicated misery, or even of obtaining a truce to his sufferings, though only for a short time. At the same time it must be admitted, that the operation of dividing one or more nerves in the living subject, must often prove an arduous and hazardous undertaking, (but not more so in many instances than bronchotomy, which has been lately performed upon a hydrophobic patient at Nottingham,) and that the operator ought to possess an adequate share of anatomical knowledge, as well as manual skill; I also allow, that in some situations it would be rashness in the extreme to attempt it; but these arguments might be urged, (or at least might have been formerly,) with equal force, against many operations now in common use; and might, if admitted, be a bar to improvement in the operative part of surgery, and in the cure of other diseases.]

* [It is singular considering the frequency of these diseases, the length of time which has elapsed, (upwards of two years,) since it was proposed, and the ease with which the experiment might be made, that no one should have thought it worth while, if it were only to gratify curiosity, to try the effect of pressure upon the nerves, as recommended above. Perhaps we might more easily discover the offending nerve, and at the same time ascertain what would be the probable effect of dividing it, by applying such a degree of pressure in the course of the suspected nerve, *above the part affected*, as would render it incapable for the time of transmitting the *aura* from the wounded part to the sensorium. The best

there are also other necessary precautions to be taken, many of which will readily occur to

method of effecting this would be, by a pad and screw so constructed as, if possible, to compress the nerve without interrupting the circulation of the blood in the limb; or if such an instrument cannot be had, by a tourniquet; the pad being placed upon the nerve instead of the artery.

If this expedient should have the effect of procuring a suspension, or even a remission of the spasms, it would afford a favourable opportunity for employing *purgatives* or other remedies *internally*, and for giving nourishment: and might possibly eventually supersede the necessity of the above mentioned operation: but if the spasms should not be suspended, or should return on removing the pressure, no time ought to be lost in performing it, where it could be done agreeably to the restrictions already, (and hereafter to be) laid down: or if this should be over-ruled, or the disease be too far advanced; in renewing, and if necessary, increasing, the pressure.

In those cases where the patient experiences that peculiar sensation (arising from the passage of the aura) *of pain darting upwards from the bitten or wounded part towards the breast or head*, (a symptom which generally occurs in hydrophobia rabiosa and tetanus traumaticus, as may be seen by consulting different authors; for it is only in these species of those diseases, that the operation in question is here advised,) it will be useful in determining upon the nerve or nerves which it will be proper to divide, for the surgeon to attend particularly to the patient's description *of the course the shooting pain takes in passing up the limb*; observing also that the division should be made in a sound part, and at such a distance from the original wound, that the inflammation may not extend from one to the other; for which reasons the space between the two should not be less than three or four inches; unless by making the incision a little lower upon the limb, we can come at the nerve with more ease and safety, or accomplish the object we have in view by dividing a smaller branch.

every experienced practitioner, but which I have neither time nor room to enumerate at present.

Another circumstance well deserving of attention will be, to choose that part of the limb where the nerve to be divided is nearest to the skin, and at the greatest distance from the large vessels and fascia; which will preclude the possibility of injuring the capsular ligaments of the joints.

What particular nerves, or branches of nerves, it may be requisite or proper to divide, it is impossible to say at present, as that must depend on the nature and situation of the wound; but I am strongly inclined to believe it will in general be sufficient to divide one or more of the cutaneous branches situated upon some part of the upper or lower extremities, (by a transverse or oblique incision cautiously made through the skin and cellular substance; the tourniquet being previously applied upon the brachial, femoral, or popliteal artery, as a measure of precaution should a branch from one of them happen to be cut;) such as for instance, those branches of the radial or ulnar nerve which are distributed to the fingers and thumb; that branch of the ulnar nerve which passes to the back of the hand; that branch of the *perforans casserii* which passes to the wrist and back of the hand; the muscular spiral nerve where it lies by the side of the *supinator longus*, one branch of which stretches to the ligaments of the wrist; or that branch of the *perforans casserii* which passes to the back of the thumb.

Should the wound happen to have penetrated deeply into the soft parts, or, instead of being situated on some part of the hand or fingers, (as is taken for granted in the sketch which has now been given,) should have been inflicted on the wrist, fore-arm, or elbow, it may possibly be necessary on some occasions, to divide the *perforans casserii* or external cutaneous nerve, where it comes out from betwixt the *biceps* and *brachæus internus* muscles; the internal cutaneous, or even the ulnar or radial nerve. And it is possible after all, that the intention may be defeated, by a small branch of a nerve

To appease the tumult in the nervous system, which forms the *second* indication of

(which may have eluded the knife) coming off from the trunk of one of them, *above the part where the division may have been made and communicating with the injured part*, by which means the aura may still continue to be conveyed, either wholly or in part: with such wonderful skill and minuteness have these necessary instruments of sensation and motion been constructed, and distributed to every vessel and fibre of the body, as to render that arrangement which in health is a source of the greatest pleasure; in diseases, (and in none more than in hydrophobia and tetanus,) a source of the greatest misery.

The description which has been given of the nerves which it may be expedient to divide in the superior extremities, renders it unnecessary to go into a similar one at present, with regard to those of the inferior; the same principles being applicable to both.]

.....

[In the Medical and Physical Journal No. 124 for the present month (June 1809) I was agreeably surprised to find, that a case of tetanus is related by Mr. Howship of Scarborough (who is since removed to London) in which the effects of pressure, as recommended above, were tried. I shall give the case, and the result of the experiment, in the author's own words.

“ A Case that proves the irritation bringing on tetanus is not peculiar to lacerated, or punctured wounds; sometimes arising after the fairest incision.

“ W. Meath, a stout, healthy man, had his leg shot away during an engagement, after the termination of which, the limb was removed by amputation above the knee. This man went on well till the ninth day, when the symptoms of lock jaw came on. Upon the day following, mercury was given both by external and internal application. This man, however, was lost, although he was in a state of compleat salivation thirty-six hours before he died.

cure, either the opiate friction applied to the legs, thighs, abdomen and fore arms every two,

“ This was *one of the cases* in which Mr. Gardner, the Senior Surgeon of the Navy Hospital at Gibraltar, gave a trial to the effects of pressure, under the persuasion that it might alleviate the severity of the spasms.

“ A screw tourniquet was applied high upon the thigh, the compress being deposited in the manner usual when it is intended to suspend the circulation in the limb. Upon the instrument being brought into action, it was observed that a moderate, and even a considerable extent of pressure, produced no apparent variation whatever in the appearances of the complaint. The spasms were neither less frequent nor less violent than they were before the ligature was tightened; when however the screw was turned to the greatest extent, or as far as the yielding structure of the soft parts would allow, there was certainly an effect produced; *the man said, that he found the violence of the pain diminished, and therefore, although the contractions were not less frequent, his sufferings from them were in some degree relieved. He expressed a strong desire that the instrument should be allowed to remain, and was disappointed upon its being afterwards removed.*”

Had the offending nerve, instead of being deep seated and surrounded by a large quantity of muscular and cellular substance, been in a situation more favourable for applying compression, (as immediately above the knee or elbow, some parts of the face, &c.) the relief would, in all probability, have been still more complete and decisive: though it appears from the “ strong desire which the patient expressed” and his subsequent disappointment, to have been sufficiently so to shew the reality of what he described, as well as the validity of the principles upon which the idea was originally founded; and if so, the propriety of continuing the practice whenever it shall be admissible, both in hydrophobia and tetanus. In

three, or four hours ; or plasters consisting chiefly of galbanum and opium, with a small proportion

what cases it may be adviseable to proceed to the operation proposed above, of dividing one or more nerves, will depend upon circumstances, some of which have been very briefly adverted to in the note preceding this, and to which I must, for the present, content myself with referring.

The object in view in either case, is to render the nerve or nerves connected with the injured part, incapable of transmitting *the hydrophobic or tetanic aura* from the latter, not only to the brain, *but to the intercostal, cervical, and other ganglia, situated in the cavities of the abdomen and thorax*; and if this can be accomplished by pressure properly applied, for a sufficient length of time; caustics, the cold affusion, the opiate friction, with the occasional use of purgatives; *or by all these conjointly*, the operation which I have ventured to propose will of course be unnecessary.]

.....

[In considering the effects of pressure upon the nerves, it occurred to me that some light might probably be thrown upon this interesting subject, by a course of experiments carefully conducted upon the horse; the nerves of the extremities being in this animal thinly covered, comparatively, with soft parts, would perhaps be more completely and easily compressed than in the human subject.

This, (together with the following passage in a letter from a much esteemed medical correspondent, “ Within the space of the last five or six years I have seen, I believe, not fewer than a dozen cases of tetanus in horses; and I am very greatly concerned to state, all *unsuccessfully* treated by cold affusion carried usque ad syncopen,”) induced me to apply to Messrs. Cooper and Gibson, veterinary surgeons, from whom I learn, that tetanus, or locked jaw as it is commonly called, is very frequent amongst this useful tribe of animals, and that they very rarely recover. The most common causes

of oil of amber, should be applied to the scrobiculus cordis, neck, and throat, and repeated occasionally.

are cold, punctured and lacerated wounds, docking, and nicking. The progress of the disease is usually as follows.

The animal refuses food, appears weak and dull, a degree of rigidity takes place in the muscles of the neck and limbs, and soon afterward the jaws become locked, when he is seized with a universal tremor, in which state he will stand for many hours, seldom laying down except in the last stage of the disease. In some instances there is a degree of fever, in others, none. Mr. Cooper in Brazen Nose-street, from whom my information was principally derived, tells me he usually gives opium, tobacco, and oil of amber, internally; and applies the cold affusion, the anodyne fomentation, and poultices, externally.

Among the farriers of the old school I am sorry to find it is a common practice, as one of them told me, *to knock out the teeth with a hammer*, in order to get down medicines by drenching; *a practice which is as unnecessary as it is barbarous*; as Mr. C. assures me there is no difficulty in introducing them into the cheek, when they readily pass into the mouth through the vacant spaces at the sides of the jaws, between the grinders and the front teeth.

Being desirous to know whether opium could be absorbed from the skin so as to affect the system generally, I enquired whether the mercurial friction had been employed in the locked jaw in the horse, but was answered in the negative. Mr. Gibson, an intelligent practitioner in this line in Toad-lane, informs me that attempts have been made to introduce mercury by friction, by the College of Veterinary Surgeons in London, but without effect.

It may not be amiss to mention, that Dr. Rush saw two horses cured of the locked jaw by issues in the neck, and by the other remedies mentioned below.

After having succeeded in this object, medicines of an oily and antispasmodic nature, such as a solution of assafoetida, with a small proportion of tincture of opium and oil of almonds, and twenty or thirty drops of Eau de Luce, or succinated spirit of ammonia, might be given internally with advantage.

To fulfil the third and fourth indications of cure, COLD WATER, *applied as recommended in* No. XIV, S. XIX, is principally to be depended upon, with the occasional use (especially in tetanus) OF PURGATIVES; but I entertain sanguine hopes, that the methods of treatment pointed out above, in considering the proper means of fulfilling the first and second

“ Perhaps it may tend ” says he “ to enlarge our ideas of the *tetanus*, and to promote a spirit of inquiry and experiment, to add that this disorder is not confined to the human species. I have known several instances of it in horses, from nails running in their feet, and from other accidents. It is attended with a rigidity in the muscles of the neck, a stiffness of the limbs, and such a contraction in the jaw as to prevent their eating. It is generally fatal. In two cases (the one in my own horse) I had the pleasure of seeing the disease perfectly cured *by applying a potential caustic to the neck under the mane*, by large doses of the oil of amber, and by plunging one of them into the river, and throwing buckets of cold water upon the other.” *Memoirs of the Medical Society of London. Vol. 1, p. 76.*]

Philadelphia, July 16, 1785.

indications of cure,* will in general supersede the necessity of having recourse to a remedy (the cold affusion) which must often prove repugnant to the feelings of the hydrophobic patient, (and in what disease is it not so at the commencement ?) and sometimes perhaps equally so to the prejudices of the friends. †

* [One advantage attending the above theory, and which is an argument in favour of its simplicity, is, that whatever tends to fulfil any one of the indications, will have a manifest tendency to fulfil all the rest.]

† [Partly from the fears of the patient, and partly from the well meant, though mistaken, tenderness of the friends, some time may probably elapse before the effects of the cold affusion in hydrophobia, shall have been fully ascertained. In tetanus traumaticus this has been already done, in such a manner and in so many instances, as to leave no doubt whatever of its utility and efficacy. See No. XVI, &c.

It will also be proper to observe, that about two years ago (viz. three years after the publication of the above remarks,*) the death of *a hydrophobic patient* was mentioned in a Scotch newspaper, and among other remedies which were tried it was stated, that *many buckets full of cold sea water had been poured upon the patient*: which is the only instance I have heard of in which this part of the above plan has been put to the test.† It is evident however that a single case, (or even two cases,) will admit of no positive conclusion either way; especially when the result is stated in such general terms, *and while there continues to be so many different methods of applying*

* See page 119.

† [Since writing the above, the cold affusion has been tried in a second case of hydrophobia which was lately admitted at the Manchester Infirmary under the care of my friend Dr. Bardsley, who was kind enough to show me the case, (which makes the fourth I have seen,) and intends shortly to publish it.]

I am fully aware of the great disadvantages I labour under in thus communicating,

the cold affusion; as if this were a matter of indifference; though it is in reality of great consequence. For example; in one instance, (a case of diabetes) the patient was placed *in a sitting posture* during the affusion; so that the lower extremities would, of course, escape being wet. (See the Medical and Physical Journal. Vol. 11, p. 548.) In another (a case of tetanus) the water was poured through a cullender over the patient, *as he lay in bed*. (Ib. Vol. 18, p. 440.) In a third instance, (likewise a case of tetanus) the patient was placed *in a tub*,* while from six to twenty-six buckets full of cold water were poured upon him. (Edin. Med. and Surg. Journal. Vol. 4, p. 448.)

The best method of applying the cold affusion according to the notions I have formed, is, that recommended above in No. XIV; S. XVIII and XIX: and in the latter part of No. XV.

A similar remark may also be made with regard to the different methods which have of late prevailed, both as to the composition and mode of applying the frictio opiata, which seem to be in a great degree arbitrary: almost every one seeming to prefer a form of his own, apparently without sufficiently considering the tendency, or *modus operandi*, of the article added: the consequence of which has been, that drugs possessing qualities of a diametrically opposite nature to the opium, have been joined with the latter in the same preparation, so as to counteract its efficacy in diminishing the morbid

* [This method of placing the patient, is, in my humble opinion, the worst that could be devised for the purpose, because by allowing the water to accumulate about the feet, legs, &c. (though it must be a large tub that twenty-six buckets full, or about seventy gallons, of water, would not fill) it must tend powerfully to counteract the effects it is designed to produce; namely, to restore the equable and regular distribution of the sensorial power, amongst the different classes of nerves, muscles, &c.; and to restore *the natural, that is, the progressive action* of the muscular fibres, generally throughout the body. See the third and fourth indications of cure.]

without connexion or reserve, the ideas which have occurred to me, on a subject of so much

irritability of the system, from which so many evils proceed. In this light I consider mercury; liquor ammon: caust: — tincture of cantharides: which have all been employed in this manner: other alterations have also been proposed.

To me they appear however to be not merely useless, but likely to be extremely hurtful in these diseases; not only by aggravating the patient's sufferings without producing any adequate advantage, but by counteracting the operation of those remedies which are calculated to be of use. To cantharides indeed, in every form, and in whatever way employed, (blisters are of course included) the objections are, in my mind, insuperable. On this point I know I have the misfortune to differ from many physicians, and others, of whose judgment in other respects, I have the highest opinion; but the conclusion has not been formed on slight or (as I conceive) insufficient grounds, as I could easily show, were this the proper place.

Cantharides have been repeatedly tried both in hydrophobia and tetanus, but never, I believe, to such an extent, as in a case of tetanus traumaticus, recorded in the 18th. Volume of the Medical and Physical Journal, page 436; which every one who has any faith in this medicine as a remedy in these diseases, or in what is commonly called a *stimulant* plan of treatment, would do well to peruse.

Another mistake has also been made by applying the fr. op. to the part affected, (the lower jaw for instance, or the muscles situated on the back part of the neck, spine, &c., in tetanus) instead of applying it to such parts of the body (as the stomach, belly, arms, legs, and thighs) as that its primary operation may be on the system at large through the medium of the vascular and nervous systems; by which means much more powerful effects are produced on the irregular actions of particular parts, than by applying it immediately to the latter.]

difficulty and importance; to obviate which, I have only to urge the sincerity of my motive, that of a wish to increase to the utmost of my power, the resources of medicine and surgery; and to request your readers will suspend their opinions on the scheme of practice I have ventured to propose, until the whole of the evidence upon which it is founded shall have been made public.

March 15, 1807.

NO. XVIII.

(Not before published.)

IN a note to No. II, (page 28) I have given a brief description of the effects of the opiate friction in Hysteria. The following are the only cases of this kind of which I have kept an account; and as they have a tendency to illustrate a method of treatment, which appears, from other testimony besides my own, to possess the power of diminishing the violence, and shortening the duration, of one of the most frequent and most distressing complaints to which the female sex is liable, I shall make no apology for inserting them.

April 9, 1802. Miss ——— æt. 18, complained of sickness about eleven p. m., and was soon after seized with Hysteria. I was called about half an hour after the spasms had commenced: they were the most violent, and the distortions of the countenance the most frightful I had ever seen. The inspirations and expirations were sonorous, and a quantity of viscid phlegm issued from the mouth; (in these respects resembling epilepsy.) She had profuse cold sweats: I several times examined the wrist, but could not perceive any pulsation. The jaws being too closely locked to allow a possibility of getting any medicine introduced by the mouth, I directed a fourth part of the following preparation, (R. Tinct. Opii drachmas sex, Sp. Æther. Vitriol. Comp. drachmas duas M.) to be rubbed in on the inside of the left arm; the same quantity was then applied to the right, and afterwards two drams to the inside of each leg. These joint operations might occupy, as near as I could guess, about ten minutes: and when about half that time had expired, the spasms abated, the muscles of the lower jaw were relaxed, and a general tremor succeeded, but continued only a few minutes, when she became quite calm. She then complained of sickness, and of the globus hystericus. An emetic was administered, which operated, after which she was ordered to take an antispasmodic draught every two or three hours. R. Sp. Amon.

Comp. Tinct. Lavend. Comp. aa Gtt. xx ———
 Opii Gtt. v Aq. pur. unc. unam. M.

April 10, Hra. 10, a. m. She has had some comfortable sleep, and has no complaint except a slight head ach.

In the month of January 1803, Miss ——— informed me she had had no return of indisposition of any kind, and that her general health was much improved.

CASE II.

April 15, 1802. Miss ——— fell down in returning from a visit last night. About midnight she began to be hysterical, and to complain of sickness, pain at her stomach, &c. At two this morning (April 16) when I was called, she was affected with hysterical spasms, locked jaw, &c.; which did not continue long before the sickness returned, accompanied with violent pain in the stomach, and screaming: what she threw up was heavy and foul, and I prevailed upon her to take an emetic, which continued to operate longer than I wished. When the vomiting abated an antispasmodic draught was prescribed, but it did not remain long upon her stomach: and now the spasms and sickness *alternated with each other with great violence, so that she was constantly affected with either one or the other*, her jaws being locked as before. A dram and a half of Tinct. Opii was rubbed in without delay, on the inside of one arm, and before that was

finished, the spasms subsided, and she fell asleep : the same quantity was then applied to the other arm, and she continued composed and easy for some time. I now left her, with directions to renew the opiate friction if the spasms or sickness should return, and to repeat the antispasmodic draught occasionally.

At eleven a. m. I was informed she had been tolerably easy since I left her, having had only one or two slight returns of the spasms, which were immediately removed by repeating the frictions with opium ; that she slept an hour and a half very comfortably from the time of my leaving her, and had slept at intervals since. Her chief complaints at this time, were soreness and debility.

April 16. She has slept well and is nearly recovered.

From the ease and rapidity with which the disease was subdued in these and other instances of a similar kind that have since occurred, but of which I have not kept a journal, I have long been in the habit of employing the opiate friction in this complaint, with a confidence which nothing but the experience I have had of its efficacy could have inspired, and which has seldom, if ever, been disappointed. Two of these seem worthy of attention. One, a case of violent palpitation of the heart, attended with pain of the neck, shoulder, and arm, of the affected side, (following the course of the

large arteries) in a young lady of an hysterical temperament: the other, a well marked case of hysteria, *in an athletic young man*; in both of which the O. F. was highly serviceable, in the former repeatedly. In the latter, the application was made to the throat and neck as well as to the arms, the sense of constriction being such as to threaten suffocation.

Might not opium applied externally, either by means of friction, or in the form of a plaster or poultice, be of use in the spasmodic croup, and in other spasmodic affections of the larynx and bronchiæ? — I am led to propose this question from a conviction of its powerful and salutary effects as an antispasmodic in hysteria, and other diseases of that class; and secondly, from the sudden and unexpected manner in which children afflicted with the croup are often cut off, (evidently by suffocation from spasm) in a short time after having been able to play and run about as usual.

The additional testimony in favour of the O. F. in hysteria alluded to at the beginning of this article, was communicated to me by Mr. Gapper, (the author of the communication contained in No. VI) in a letter he has lately

favoured me with, from which the following extracts are taken.

“ I have not published any case or observations on the subject on which you have so ably written, since that you allude to; (see Page 42); and on referring to my notes I find one case only recorded, which was a very violent one of hysteria. The spasms in the throat in this case were so extremely violent as totally to impede deglutition, and the least attempt to swallow the smallest quantity of either fluid or solid, renewed them with increased violence. Great pain at the stomach was complained of, and the whole frame strongly convulsed. To give medicines in this case was quite out of the question, as it was absolutely impossible. The pulse was quick, but I see I have not noted the number. I therefore ordered a liniment composed of Tinct. Opii: Ol. Amygd. each two drams, mixed together with yolk of egg, to be rubbed into the thighs every six hours. After the second friction the spasms were much abated, she had been composed nearly three hours, had had a stool and the pulse 84. The difficulty of swallowing was not in the least relieved. The friction continued as before. The next day the violence of the spasms continued to decrease, and she could in a certain degree swallow, but not without occasioning some return of the spasms. I found she had slept well in the night; that the pain of the

stomach was abated, that she had passed a stool, and that the pulse was much quieter, and at 80. The liniment was now directed to be used morning and night only. On the fourth day she was tolerably well, had slept undisturbedly, could swallow as usual, had lost the pain in the stomach, the bowels open, the pulse quiet and at 70. It will not probably be considered as irrelevant to the subject to inform you that this woman was of a peculiar, irritable habit. In all her labours, she has been so much afflicted with spasm in the thighs and muscles of the abdomen, that they have greatly retarded, nay in two instances have absolutely extinguished the labour pains, even when the head of the foetus had rested on the perinæum some time; and I have been obliged to use quantities of Tinct. Opii and Æther, and give opium and assafoetida every half hour, before I could overcome them. The foetus was in both instances expelled by two or three real pains, as soon as the spasms were overcome.

“ I shall be happy to see your observations on the use of the opiate friction in hydrophobia. I have long determined, that if ever a case should fall under my care, I would employ it in its utmost extent. It is rather singular, that although I have been in practice twenty-five years, and for the last fifteen a very considerable one, I have never once seen a single case of hydrophobia; neither do I think cases of canine mad-

ness occur so frequently as is generally supposed. It is a circumstance materially in favour of opiate friction, that the bowels do not become constipated under its use,* and I have no doubt it

* [A similar remark was made by the late Dr. Percival in an early stage of the business, (see page 26.) and from the various testimonies which have since appeared in support of it, there can be no doubt of the fact. But this is not all. Were I to reason from my own observation and experience I should say, that so far is the *frictio opiata* from diminishing the peristaltic motion of the stomach and intestines, (and thus inducing costiveness, vertigo, head ach, and the other evils attendant on the *internal* use of opium) that it seems evidently to *increase* it; and it was this effect to which I alluded, when I made the following remarks.

“ As an illustration and at the same time as a proof of the truth of what has been suggested, it may be worth while to compare the state of the appetite and the circulation in a few hours, or in any given time, after a dose of opium has been *taken internally*, with the state of these functions when an equivalent portion has been *applied externally*.

“ If opium produces any one effect more regularly than another in the former mode of exhibiting it, namely, by the mouth, it is that of *impairing* the appetite and digestion; and it often as we have seen, *increases* the frequency of the pulse. But in the latter mode of applying it, namely externally, the effects are exactly reversed, that is, the appetite and digestion are *never* impaired, *but often improved and strengthened*, and the frequency of the pulse is diminished.

“ The causes are obvious and easily explained, if we only keep in mind that in the mode of exhibiting it first supposed, it comes into contact with the internal surface of the stomach and intestines, but must pass through a circuitous course before it arrives at the heart and arteries; and that in the other mode of introducing it, namely, by the lymphatics,

may be made use of in all spasmodic affections with the greatest safety and good effect."

I am Sir

very respectfully yours,

EDMD. PITTS GAPPER."

Ewell, Feb. 21, 1809.

NO. XIX.

(Not before published.)

IN the following cases of Delirium Maniacale, the effects of the opiate friction were very remarkable.

In the first case, the disease was preceded by Epilepsy.

Case I. Mr. ———, a robust young man, of intemperate habits, has been subject to Epilepsy some time. When the convulsions subside,

it has immediate access, or nearly so, to the heart and arteries, but has no immediate communication with the alimentary canal." (Medical and Physical Journal, Vol. 7, p. 502.)

That such has been the result of this practice is evinced by the facts which have been recorded, and to which I beg leave to refer: in what *manner* these effects are produced is a question which I shall not attempt to discuss at present. It is sufficient for every *practical* purpose, (and is, as Mr. G. observes, a circumstance materially in its favour) to know, that it is free from the inconveniences already mentioned.]

they are immediately succeeded by the most furious delirium, during the continuance of which he complains of violent pain in the head, and is extremely loquacious and unmanageable. The first time I saw him in this state was in October 1803, between twelve and one a.m. — Being unable to prevail upon him to be bled, or to take any medicine, I left him with directions to allow him to walk about *in a cool dress* as long as he chose, and to embrace the earliest opportunity of applying half an ounce of the Tinct. Opii to his arms, and to repeat it in half an hour or an hour, if he did not become calm.

At eleven a. m. I learned that the delirium had continued 'till near three, when he complained of a heaviness in his head &c. The O. F. was not applied.

Nov. 20, 1803. Mr. ——— (the subject of the preceding case) was seized with a fit when at supper. It began with the following symptoms. He fixed his eyes steadily on the person who sat opposite to him, and continued in that attitude about five minutes, when he sank down in his chair, and continued in a state of stupor about ten minutes longer. At the end of that time he began to struggle violently and broke away from his attendants in the most furious condition imaginable; in which state he remained, no one daring to approach him, for perhaps a quarter of an hour, when he was

somewhat calmer, and consented to be bled; but he soon became as furious as before, so that it was impossible to bleed him, or even to examine his pulse.

Whilst he was in this situation, six drams of the Tinct. Opii were rubbed upon his arms by two assistants as speedily as his restlessness would permit. It was very soon absorbed: but before it was finished, indeed almost immediately after the commencement of the friction, his fury abated, and he began to be loquacious and chearful, but talked incoherently. But what is very remarkable, (and what never happened in any former attack) is, that he asked what was the matter with his arms for *that he had lost the use of them*. By and by he complained of pain in his hands and arms, the muscles of which seemed to be rendered nearly incapable of motion, though he continued to talk irrationally, but sat still: his pulse was somewhat irregular, slow, and neither hard, full, nor strong. He now complained of pain on the right side of his head, (the pain had been in the back part till now) and begged it might be rubbed. Shortly afterwards (perhaps in five or ten minutes) he said he was sleepy, and the pupils became more dilated than they were before the O. F. was applied: the drowsiness increased gradually, but he every now and then exclaimed *that his arms were quite useless, and frequently attempted, but seemed unable, to lift them up*.

The inability of motion now began to be general, and sleep was evidently about to take place. In this state I left him, and visited him again in half an hour: his eyes were blood shot; the pupils dilated; when an object was brought near to the eye, he seemed to observe it for a moment only; he moaned gently; the saliva dribbled from his mouth, once or twice he was sick, pulse small, quick, and irregular; the insensibility was such that neither speaking to him nor shaking his arms roused his attention. He was put to bed and proper cordials were administered.

Nov. 21. at noon. (the day following the attack). He was composed and rational, complaining only of a slight pain in the occiput, of having been sick several times in the course of the morning, *and of a weakness in his arms.* Both he and his attendants said he was much better in every respect, than he ever was before *so soon after having had a fit.** The attendants farther said that he remained insensible and drowsy till midnight, when he awoke, and seemed very well, *except that he was unable to speak,* (this was also an unusual circumstance) which he made his wife acquainted with by writing to that effect. At one o'clock he spoke as usual,

* He was evidently better this morning, than he was on the second day after the fit he had in October.

and had no relapse, though he was restless. An emetic and a bitter tincture were prescribed. A small bottle of the Tinct. Opii was also sent at the request of Mrs. ———, to be in readiness in case of an attack.

For the three succeeding years, the returns were, I believe, neither so frequent nor so violent as before : whether owing to the timely use of the proper means, or to a change in the habits of the patient, I cannot say certainly, probably to both of these causes. *

.....

Case 2. Mr. J—— H——, æt. 22, addicted to hard drinking, has had repeated attacks of maniacal delirium ; the last and most severe of which was in August 1808. After several very turbulent and sleepless nights, I was called in on the evening of the 30th. A considerable degree of fever prevailed ; the circulation was hurried ; *he talked incessantly*, and every movement was expressive of the greatest possible degree of terror and alarm ; to escape from the imaginary causes of which, he was constantly

* In an epileptic patient who was under my care so long ago as the year 1792, a permanent cure was effected by one copious bleeding during the paroxysm, followed after a short interval, (which was employed in exhibiting an emetic, aperients, &c.) by a moderate use of cold bathing, and a complete change in the accustomed habits with regard to diet, exercise, &c.

endeavouring to get away from his attendants, especially during the night.

Bleeding, refrigerants, purgatives, anti-spasmodics, and the opiate friction, were prescribed: a strait waistcoat was also procured to be in readiness; a precaution which happily proved unnecessary.

The O. F. was applied soon after he had been bled, (both of which were performed with difficulty, owing to the extreme restlessness,) and ordered to be repeated every two or three hours till he became more composed; the good effects of which were very soon evident, so much so, that it was used only twice in the course of the night; and at my next visit the day following, I found him in a state of comparative ease and composure both of body and mind.

Without continuing the narrative it will be sufficient to observe, that he was so completely recovered by the 5th. of September, as to require no farther assistance, either medical or otherwise.

.....

Case 3, Was communicated to me by Dr. Bardsley.

A poor man was brought to the House of Recovery in Manchester, in a state of furious delirium.

A strait waistcoat was with great difficulty got on, but was soon torn in pieces. Its place

was supplied by another, and over that a second was put on, from both of which he very soon disengaged himself, and tore them into shreds. Attempts were repeatedly made to give him some medicine internally, but in vain; he spat it out with the greatest vehemence, and continued as furious as ever. In this state, half an ounce of tinct. opii (mixed with two drams of oil of almonds and a little yolk of egg) was rubbed into the legs and thighs in the usual manner, which was speedily, (indeed almost immediately) followed, by calmness and composure, so as to render any kind of coercion unnecessary.

.....

From the success which has attended this practice in the different kinds of delirium, (the febrile and maniacal) as above described, there can be no doubt whatever, in my mind, of the propriety of adopting it in the idiopathic and symptomatic phrenitis. Nor need the most timid practitioner be alarmed on account of the proposed innovation, as I imagine every one must by this time, be so far convinced of the efficacy of the plan, and of its probable utility in the diseases to which I propose to extend it, as to prevent even the suspicion of any injury being likely to arise from it. Neither will it be contended, that the medical art has attained such perfection in these instances, whatever it

may have done in others, as to preclude the necessity of farther improvement. Indeed when the delicate texture of the brain and its membranes, and the influence and controul which this organ has over every vessel and fibre of the body, are duly considered, we shall not wonder that the disease should be so rapid in its progress, or that it should so often prove fatal. In no case whatever are the sensations more poignantly acute, or the functions more disturbed; nor is it possible to imagine a case in which it is of more consequence, that the sensibility and irritability should be kept within due bounds, or if allowed to become excessive, that they should be *speedily* reduced to the healthy standard: and what article in the *Materia Medica* is so well calculated to fulfil these intentions as the *frictio opiata*, we have yet to learn.

I cannot conclude these remarks without recommending the above facts, &c., to the notice of the profession, particularly of those gentlemen who have frequent occasion to exercise their judgment in that important department of medicine, the treatment of insanity.

In every stage of this disorder, (especially in the early stage when medical skill is of the greatest avail,) as well as in the advanced stage of every *acute* disorder, (as has been exemplified in various instances,) some of the movements, if I may be allowed the expression, go too quick, others too slow, and others, *in a*

wrong direction. In these states of corporeal and mental derangement, nothing that has been hitherto tried is so efficacious in rectifying these irregularities, (and I appeal to undeniable facts in proof of the assertion) as the opiate friction. It is also to be observed, that the composure which it produces is much more *complete and permanent*, (besides being more speedily obtained, *and in a manner infinitely more convenient to all parties,*) than that which is produced by coercion, employed either singly or in conjunction with *internal* remedies, *where these can be administered*, which is far from being always, or even generally the case.

For these and other reasons, already specified, I have long wished it to be put to the test in Melancholia, (Cullen's Syn. v. 2.) particularly in those species of this malady which are so alarmingly prevalent in this island, *and so often terminate in suicide*; proceeding from *despondency*; whether arising from the state of the patients' affairs; (Melancholia Vulgaris:) from vehement love; (Melancholia Amatoria:) from superstition; (Melancholia Religiosa:) *from weariness of life, or ennui*; (Melancholia Anglica:) In all these cases, the opiate friction, (assisted by other appropriate remedies) may, I think, be regarded as the chief, if not the only, anchor of hope.

In puerperal convulsions I should expect to derive much benefit from the opiate friction as a palliative to restrain their violence, and to promote the regular action of the uterus, as every thing must ultimately do, in a greater or less degree, that has that tendency.

In this case it should be applied alternately to the arms, (between the wrist and axilla,) and to the epigastric and abdominal regions, and to be continued with gentleness half an hour or an hour, or until the spasms abate, and the intervals become longer; which may be done without interfering with the other means which may be necessary for promoting the delivery. Cold water should also be sprinkled on the face as advised by Dr. Denman.

The only case of this kind I have seen, happened before I became acquainted with the practice recommended above. The spasms came on periodically, commencing with a violent spasmodic contraction of the muscles of the lower jaw, neck and spine, the effect of which was, to turn the head almost completely round upon its axis; the jaws were also locked, and the spine bent backwards in some degree: at the same time, the muscles of the face and eyes (which were wide open), were thrown into strong convulsive action.

When the labour was over (which took up many hours,) the convulsions ceased; but the delirium, or rather stupor, continued two or

three days ; when the organs of vision were found to have sustained great injury ; (their appearance was that of amaurosis,) probably from the excessive action with which the muscles had been affected during the continuance of the spasms, having rendered them incapable of performing their functions ; and it was only by slow degrees, and after an interval of many months, that the retina regained its sensibility, and the muscles their proper action.

When the patients reason returned, she appeared totally unconscious of every thing that had passed in the interval between the early stage of her labour, (of which she had a perfect recollection,) and the period alluded to.

.....

In those rare but commonly fatal diseases, the Catalepsis, and Risus sardonius, I entertain sanguine hopes with regard to the success of the frictio opiata : but here it will be proper to call in the aid of the *cold affusion*, and to attend to the state of the bowels. I am also of opinion, that the cure of St. Vitus's dance, or Chorea Sancti Viti, might be greatly expedited by a similar plan of treatment, assisted by tonics, chalybeates, &c. In the latter, the water should be applied in a tepid state for a time or two at first, and afterwards, cold ; and used in a morning : the frictio opiata in an evening.

.....

I have not yet tried the opiate friction in the Jaundice, when attended with spasmodic constriction, and pain, from the passing of gall-stones along the ductus communis choledochus; but have no doubt of its utility, in conjunction with the cold affusion. I have known an instance of Icterus in which the pain and spasms were immediately relieved, by a draught of cold water, after opium *internally*, &c., had failed, which is a presumptive proof, in my mind, in favour of the efficacy of the cold affusion, as recommended above. But positive proofs being preferable, where they can be had, I am happy in being able to adduce such as will, I imagine, be fully sufficient to sanction the practice, which I have taken the liberty to recommend; (and which I lately met with in the Memoirs of the Med. Soc. of London, vol. 2, article 25 :) from which it appears, that great numbers of people afflicted with the Jaundice, have been, *from time immemorial*, in the habit of resorting to a well in Ireland which is about a foot and a half deep, and five feet across. “In this pool the patient, stripped to his shirt, is seated, *whilst the water is plentifully heaved upon his head and body*. Thus thoroughly wet, and still keeping on the wet linen,” (this part of the ceremony

must have been highly dangerous and unnecessary;) “ he is put to bed in some neighbouring house; on which a most profuse sweat breaks out, and continues, for a great many hours. The relief is often so sudden, as to produce a strong craving for food as soon as he rises from bed. This operation is repeated thrice, in order to compleat the cure.”

“ As to the efficacy of this method of cure, Mr. Skelton says, that great numbers have bathed in this well for the jaundice, and been cured, (*to his certain knowledge for more than forty years*) after trying all other methods recommended by their friends and physicians, *but in vain.*”

Common water was afterwards tried, applied in the same way, and in the same complaint, both by the author of the paper, and others; and with the same success of course.

NO. XX.

(*Not before published.*)

IN the convulsions preceding the confluent small pox, I have lately experienced the good effects of the frictio opiata. I shall give a brief description of the cases.

MISS C. — aged two years, was seized after a few days previous illness with convulsions, in which state she was at my first visit. Her eyes were fixed; her jaw locked; the muscles, particularly those of the left side, were spasmodically contracted, and the skin was bedewed with a cold sweat.

Being debarred from giving medicines internally, I had recourse to the opiate friction, * which procured immediate relief from the spasms and the child slept comfortably nearly an hour, when she was threatened with a return, but by repeating the friction, the same effects were produced, and in the evening some spots were visible on the face and neck, which were followed by a plentiful eruption, confluent in some parts.

The next day an elder sister aged four years, who had also been feverish several days, was attacked in the same manner (except that the jaws were free,) but the spasms were more severe, and interrupted with violent screams: the contortions, particularly of the legs and arms, were extremely violent. Saline anodyne medicines were prescribed, (aperients had been already given; and operated plentifully;) but at the request of the parents who had witnessed

* R. Tin. Opii unc. dimid. Linim. Sapon. Aq. pur. aa drachmas duas, M.----Some of this formule was directed to be rubbed upon the stomach; the friction being discontinued as soon as the desired effect should be obtained.

the powerful and salutary effects of the opiate friction in the younger child, recourse was had to the same application, and with the happiest effects; for though she was kept cool, and took refrigerants and anodynes internally at proper intervals, still the spasms returned; but were as often subdued and rest procured in the way which I have described.

It is remarkable, that neither in this, (which proved an extremely bad case of the confluent small pox. *) nor the former case, was there any

* It is melancholy to reflect upon the many thousands of lives that are annually lost in the British Dominions by the natural small pox; and what renders it still more so is, that many, perhaps the greater part, of those who escape with life, have reason to lament the effects of that prejudice, or whatever might be the cause, which prevented their parents from availing themselves of that simple, though salutary mean of prevention, the cowpock inoculation. It is much to be feared, however, if we may judge from the great number of deaths which has happened from this cause in the course of the present year in this town; that nothing effectual will be done to remove the evil, until the legislature shall in its wisdom, think proper to enact, (as was said to be in contemplation the last year,) that every housekeeper having the natural small pox in his family shall be obliged to give notice thereof, by placing a board with words to that effect upon the front of his house, and that proper steps should afterwards be taken to cleanse the house from the infection.

2. That no person shall be inoculated for the small pox, except in a house to be set apart for that purpose, at the distance of two or three miles from any other.

Perhaps the conclusion may be somewhat premature; but if I

secondary fever; though in a third instance which was under my care at the same time, (in which the eruption was also confluent, but not being attended with convulsions the opiate friction was not employed,) it took place to a considerable degree, and was followed by abscesses in different parts of the body.

A Case of Spasmodic Cough.

MISS E. C. aged four years, was brought to me in a weak emaciated state, accompanied by an obstinate cough (frequently ending in vomiting, though without the hooping noise peculiar to pertussis,) and bowel complaints of three months' continuance, for which she had taken various medicines without effect.

Emetics, purgatives, pectorals, tonics, &c. were given with advantage to her general health, which was found at the end of a month to be considerably improved; but the cough was more violent than ever, and besides being at-

might judge from my own experience I should say, that the other disorders peculiar to infancy, (particularly the hooping cough) have been milder in those subjects who had had the cowpock, than in those who had had the small pox: the former seeming to fortify, and the latter certainly weakening the constitution.

tended with a copious expectoration (as indeed it had been from the first) blood was brought up, sometimes in streaks, often pure or nearly so: the fits of coughing continued without intermission for many minutes together so as to produce the most violent agitation, especially in the night, which was generally passed without sleep, or if she happened to dose, she awaked in such frights, that it was impossible to pacify her, though opiates were given internally in various forms in addition to the other medicines, blisters behind the ears, &c.

In this state the opiate friction* was directed to be applied to the stomach at bed time, and to be repeated on the approach or accession of a paroxysm. By this plan, she was so immediately, and effectually relieved, as to render any further assistance, unnecessary.

* R. Tinct. Opii drachmas sex. Linim. Saponis drach. duas; M. This mixture divided into four or five parts was the only preparation employed.

END OF PART I.



